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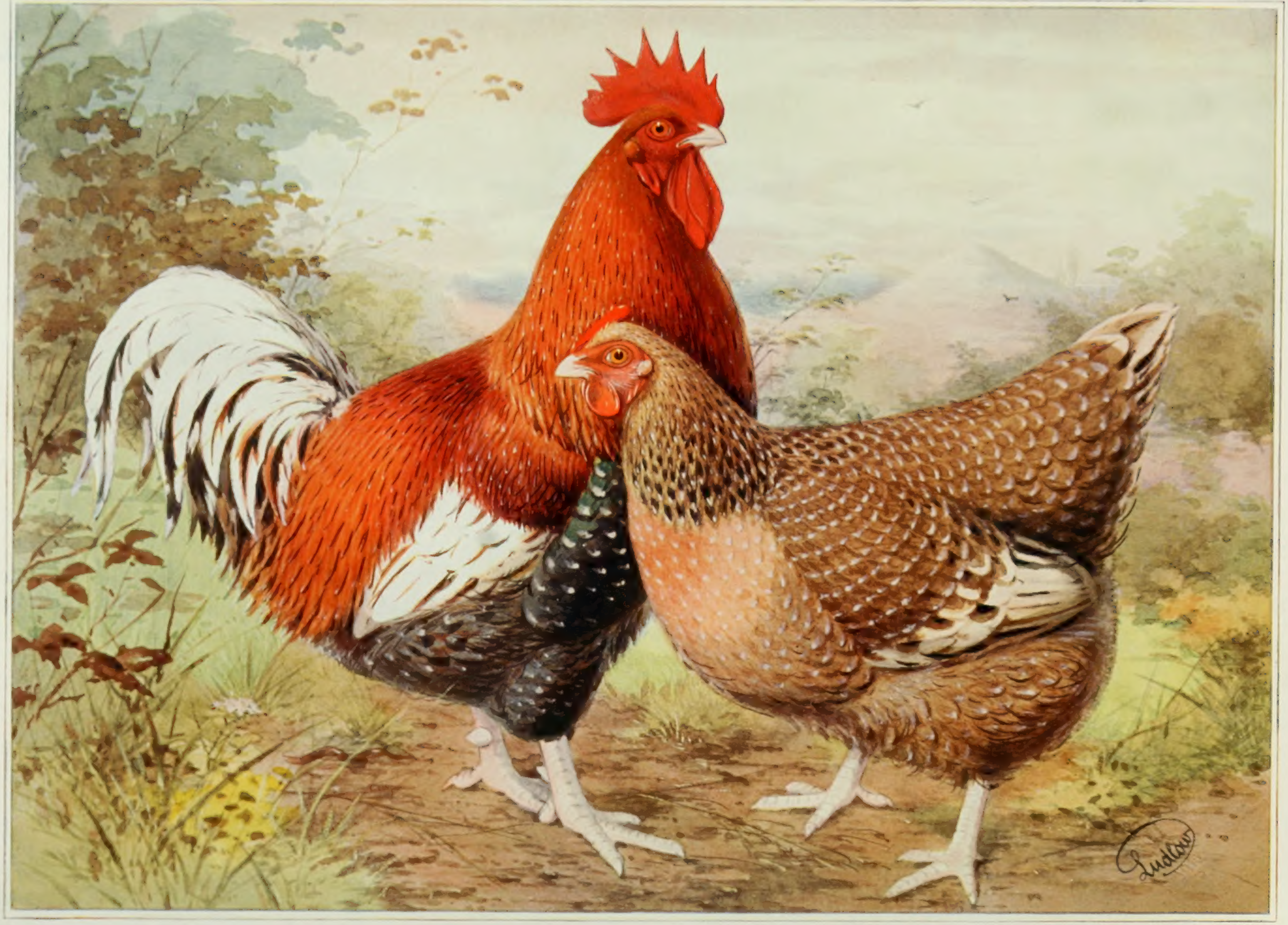

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WRIGHT'S BOOK OF POULTRY

REVISED AND EDITED IN ACCORDANCE WITH
THE LATEST POULTRY CLUB STANDARDS

BY

S. H. LEWER

OF "THE FEATHERED WORLD"

ASSISTED BY LEADING SPECIALISTS

WITH THIRTY COLOURED PLATES AND
NUMEROUS OTHER ILLUSTRATIONS

CASSELL AND COMPANY, LIMITED
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FOREWORD

THE task of an Editor called upon to undertake a new edition of such a work as Lewis Wright's BOOK OF POULTRY is simplified by the fact that in its many successive editions its author kept it so well abreast of the times that the reviser's task consists chiefly of additions concerning new varieties introduced since the book was last published in 1904.

Certain statements in the text, it is true, had to be modified in the light of later experiences, and especially was this the case in connection with the references to American poultry plants, for many of those described in the last edition are now defunct, and the space devoted to them has been made use of in other directions. Still, as far as possible, Lewis Wright's text has been supplemented rather than altered. Specialists in each variety have rendered me, as Editor, the same kindly help that they did the author in supplying notes on the different varieties where alterations or additions were necessary, and my friend, Mr. F. J. Broomhead, has assisted me in the book's general revision, and especially in connection with the incorporation in the work of The Poultry Club's new and revised standards of perfection issued in 1910.

The addition of these latest standards of perfection, amplified and thoroughly revised as they have been by Mr. W. W. Broomhead since Mr. Lewis Wright's death, mark an important advance in the usefulness of THE BOOK OF POULTRY. It is right to state here that, except as regards this work and the volume of the Poultry Club, the copyright in these standards is reserved.

Several new Coloured Plates are added to this edition, either portraying new varieties or else differences in type since the last edition was published. It is no small gratification to me that in this side of my work I had the assistance of Mr. J. W. Ludlow, whose artistic connection with THE BOOK OF POULTRY since its first edition in 1872 thus remains unbroken.

The inclusion of a chapter on Mendelism by so expert and practical a fancier as the Rev. E. Lewis Jones, B.A., will, I trust, put before breeders new and useful theories. These, if studied in conjunction with Wright's masterly chapter on pedigree or line breeding, will do much to keep poultry-keepers on right lines in raising stock, either for fancy or utility purposes.

A further addition is a short life of Lewis Wright by myself, and many who have profited by my old friend's writings will welcome this and the portrait which accompanies it. Finally I may, perhaps, be pardoned in saying that it is no small gratification to me, after thirty years of close friendship with Lewis Wright, to be afforded by Messrs. Cassell the opportunity of adding in the smallest degree to the continued usefulness of his lasting monument—THE BOOK OF POULTRY.

S. H. LEWER.

FLOCK OF DUCKS

Photographed at Messrs. Wm. Cook and Sons' Farm, Orpington, Kent.

Mr. [illegible]

INTENSIVE AND SEMI-INTENSIVE POULTRY-KEEPING

By The Editor

THE INTENSIVE SYSTEM

"The City System."

EXCEPT for a few bold pioneers, such as Majors [illegible] and Mansfield, and those backyarders and fanciers who, owing to lack of space, had perforce for years practised intensive poultry-keeping without styling it such, the present system of intensive poultry culture in the British Isles may practically be said to date from the interest aroused by the poultry plant installed by Mr. Randolph Meech at the Festival of Empire held at the Crystal Palace in the summer of 1911.

Styled then "The City System" by Mr. Meech, though later receiving the now better-known prefix of "intensive," it was, we believe, frankly based by its promoter on American ideas, which were subsequently still further developed by visits to leading establishments in the United States, which were interestingly described in *The Feathered World* of Sept. 29, 1911, and onwards.

In the States, due largely no doubt to the rigorous winter climatic influences prevailing, intensive poultry culture is of older origin. One of its leading exponents, Mr. Philo, of Elmira, N.Y., has been practising it for about thirteen years. Prior to that he had kept poultry in the ordinary way for twenty-five years; but his conversion to the system of closely confining birds in small houses (the average size used being 6 ft. long, 3 ft. wide, and 3 ft. 6 in. high) came about in a curious way, and was told by him to Mr. Meech. It appears that, having occasion to change his residence, he was only able to retain a few of the best of his stock. These, for lack of other accommodation, were confined in piano cases and like receptacles pending the preparation of their new quarters. To Mr. Philo's surprise, these closely confined birds gave far better results in eggs than any which he had previously received from them, and from this chance occurrence sprang the inception of the Philo system, which has now developed into an enormous industry, with some 5,000 laying hens and a big trade in appliances, eggs and chicks.

Other American poultry-keepers favour larger pens of birds, varying from 30 to as many as 500 fowls in a single laying house (the Corning establishments in New Jersey indeed running as many as 1,500 birds in each of their buildings, which are 160 feet long), and the same differences of opinion as to size of flocks hold good here; but in all, the fact is recognised that the restriction of liberty necessitates a greater care in diet so as to make up for the loss of natural food, combined with good housing, extreme cleanliness and ample provision for exercise for the birds.

To these few notes of explanatory introduction, it is necessary to add that the time has not yet come to state definitely the position which purely intensive poultry culture is likely to take in this country, and much of what follows is the record of experiments rather than matured conclusions; but its development since 1911 has been very remarkable, and that it has a value to poultry-keepers, if wisely handled and its limitations recognised, there would seem to be little doubt. Especially is this likely to be the case with the class of poultry-keepers generally known as "backyarders," for by its means, instead of a pen or two of birds, each with their house and too often unsightly and unsanitary run tainted by the droppings of years, the new system admits of quite a flock of layers being kept—and, moreover, well kept—in comparatively little space.

Major Falkner's Methods.

One of the foremost and most scientific exponents of intensive poultry culture in small flocks in this country is Major P. H. Falkner, R.A.M.C., of Loughton, Essex, who has spent much time and thought in experiments connected therewith, and especially as to economic housing and feeding. A feature of this gentleman's poultry plant, when we visited it, was the material of his houses, which largely consists of unbleached calico. The floor is of wood, raised a few inches off the ground, surmounted by a framework of wood nine inches wide, on which is stretched wire netting; three sides of this frame are covered with calico, but the front is left uncovered. The roof of the house, which is adjustable, is a similar combination of framework, netting and calico. All the houses are made on the place, and the woodwork and calico are treated with vegetable tar mixed with tallow as a preservative. The roof in addition to this for waterproofing purposes receives a couple of coats of coal-tar, and is then sanded before dry.

These houses, from their lightness, are easily moved, and yet most durable, and have the advantage of considerably reducing initial expenditure on appliances; a house 6 ft. by 3 ft., to hold six birds, costing but 10s. 6d. finished. A larger size, 6 ft. by 6 ft., to hold twenty White Leghorn pullets, worked out at about 25s., and repairs in case of damage are easily effected.

All the drinking water given to the birds was, we noted, coloured with a solution of permanganate of potash as a precaution against the introduction of disease. For the dry mash used we noticed an ingenious device in the substitution of a hanging calico trough for the ordinary wooden feeding box. It is found that the yielding character of this material to the pecks of the birds entails practically none of the waste usually present with wooden troughs.

On the essentials of intensive poultry-keeping Major Falkner very kindly sent us the following notes:

Major Falkner on the Intensive System.

"Firstly, what is it? As the writer understands intensive hen culture, it consists in maintaining, and to some extent raising, poultry upon limited areas of ground in such a manner that both the soil and the fowls themselves are protected from certain atmospheric influences.

"With former intensification methods this vital principle was, generally speaking, but partially complied with; and in those cases where such was otherwise, the operator had not the requisite training in the science of animal feeding, etc., to maintain his stock in that perfect health that is so necessary for 'egg machines' that were expected to lay at great speed under highly artificial conditions.

"In the majority of cases, however, the culture was attempted by placing numerous fowls upon a small and limited area of uncovered soil—more or less permanently. Now soil is one of Nature's greatest disinfectors; it contains within it myriads of small organisms for the purpose of breaking up organic matter, such as poultry manure, the presence of which would provide an unhealthy environment for the animal and vegetable kingdoms. When organic matter is present in moderate amount, these scavengers are efficient workers, but once contamination reaches excess they are literally poisoned, and suspend or cease their efforts for good and all. In poultry manure, for instance, there is nothing harmful in the way of toxins or poisons to which we refer. They appear only when sufficient moisture and heat are available for the development of putrefactive organisms, the life cycle of which is associated with poisonous gases and toxins fatal to the health of the soil germs themselves, or those poultry that have the misfortune to be continuously subjected to such insanitary surroundings. Not only do the poultry inhale the noxious fumes rising with the cool ground air as it expands from the heat evolved in the putrefactive process, or that actually forthcoming from the fowls themselves, but they unavoidably consume much fetid matter adherent to grain or other food that is served.

"Within these few scientific facts lies *the* great principle of modern intensive hen culture. We cover our intensive hennery with a waterproof roof, and we remove its litter bed (by means of a raised floor) from the influences of ground air and its moisture. We aim to retain all excrement from our fowls in a 'dry as dust' condition, because we know that by this means its ammonia, etc., becomes 'fixed,' and the organisms of putrefaction are unable to reproduce their kind through the absence of moisture and heat—no putrefaction can possibly take place.

"We do more than this. An efficient intensive house has a front that is perfectly open at all times, so that the air within its walls is maintained in a state of absolute purity year in and year out; yet in such a manner that the birds are never subjected to draught, excessive exposure to sun rays, or the lack of light so necessary for their welfare. The fowls' food is exactly what we choose to make it for any given purpose; for have we not absolute control of the ration, although we are often sadly ignorant with regard to the formation or application to the hen flock.

"Similarly, we can compel the fowl to take as much or more exercise within a first-class intensive house as ever she could obtain upon a perfectly open range.

"We claim for our system that, by means of it, the average hen can produce thirty per cent. or more eggs during the winter months, or, for the matter of that, during any given season, than is possible otherwise. This may appear an extravagant statement to those who are unacquainted with the method, and especially to the many who have already suffered loss through the supposed advantages of poultry-keeping; yet we simply make the statement from some five years ardent, continuous, and practical work upon intensive lines.

"Why it should be so is clear enough to the writer. A laying hen exposed to the vagaries of our climate can, and should, be kept in 'the pink of condition' upon a free range. Good fare, health, and comfort may one and all be hers; yet her nutrient intake, her food, must expend itself largely to overcome needless exercise, effort that is at one time more, and at another time less, than is necessary for her health. Not only so in respect to this class of work, but an equally large measure of fruitless effort must be directed elsewhere. We refer to the great work of her vasomotor system; the contractions of her surface blood vessels in their effort to drive the blood stream to deeper levels in order to maintain the balance of the body heat. This means a great deal of work, and as such, much needless waste of food that is no longer available for egg production. Even where food is more than enough for every demand of the fowls' bodily needs, the very fact of these requirements undergoing sudden alterations—great and small—will account for the difference between free range and intensive 'results.' The egg-producing organs of a domestic hen are at their very best when the influences of her environment change but little. For instance, a given flock reaches a certain average daily production. Suddenly the weather changes; it matters not whether from heat to cold, or the reverse, the average return of eggs will fall until the flock adjusts itself to the alteration, whatever it may be.

"The intensive house provides open air without the disadvantages of open range, and provided the operator has a good knowledge of his subject, practically all its advantages in so far as egg production is concerned."

Mrs. Baynes on Intensive Poultry-Keeping.

Major Falkner, in the preceding remarks, puts the case for the intensivist very lucidly and fairly, but in his concluding paragraph might have added a reference to the great advantage to the poultry-keeper of having the work close at hand in compact form, and thus making it particularly adaptable for ladies, of whom numbers have taken up its pursuit. As well known amongst these we may mention Mrs. Baynes, of Boreham Wood, Herts, the author of "Intensive Poultry Culture,"* a handy textbook on the subject, and who has for some time successfully practised intensive methods for the production of table poultry and eggs, as well as achieved exhibition honours. Her plant, of which several photographs are here reproduced (*see* pages viii. *and* ix.), is especially interesting as showing what can be done in the limited area of a suburban garden, comprising as it does one house for 30 birds, one for 70 birds, and several holding from 6 to 10 birds in each; besides which are smaller coops for rearing young stock, giving a total capacity of 350 to 400 birds on $\frac{1}{20}$ of an acre of ground.

The house for 70 birds is divided into three sections, as Mrs. Baynes is a strong believer in *small* flocks, and considers 30 birds the maximum number to be kept in one house or section of a house, both from the standpoint of health and also egg-production.

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* *The Feathered World*, London, W.C.

House for 30 Birds on Mrs. Baynes's Intensive Plant showing Rain-shutter Up. Note the Overhanging Drip-board at Top.

The prime factors to her success are, in Mrs. Baynes' opinion, scrupulous attention to good housing, hygiene and feeding. As regards the first, a good idea of the buildings in use can be obtained from our photographs, the guiding principle being to provide a superficial area of at least 3 square feet per bird, and ensure good ventilation, dryness of litter at all times, combined with shelter sufficient to give warmth in cold weather and shade from heat in summer. To this end, as in all well planned poultry houses, the houses are open-fronted, and also higher at the front than at the back, so as to allow of the maximum of light and air reaching the birds; windows at the sides also help in this respect. To keep out driving rain or snow, a wide overhanging drip-board at the top and adjustable Hessian shutters are used. These latter are also of service in very cold weather in maintaining equable temperature, whilst, from their porous nature, admitting ample ventilation and light.

The sizes of the houses here illustrated are, for thirty birds, 10 ft. 9 in. long by 9 ft. 6 in. deep, and 6 ft. 6 in. high in front by 4 ft. 9 in. at back. For the smaller breeding pens of ten birds, the size of house is 7 ft. 6 in. long by 4 ft. wide and 3 ft. 3 in. high.

The whole of the appliances here are well and substantially built, and whilst entailing considerable outlay at the start will, if properly looked after, last a lifetime.

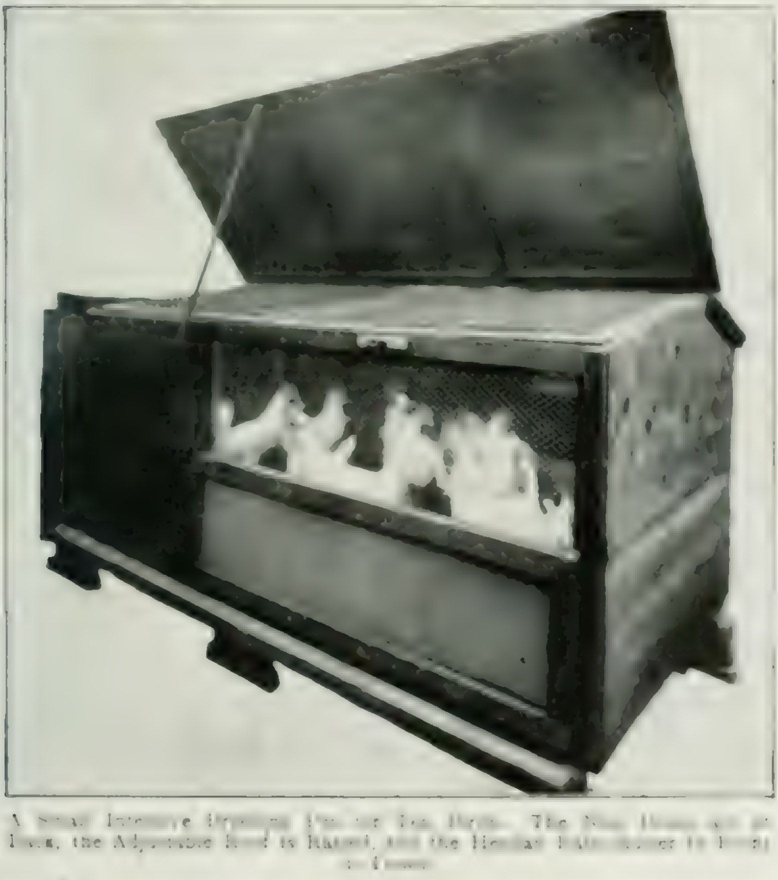
Mrs. Baynes, who has the advantage of a wide experience in answering correspondents weekly in *The Feathered World*, sums up her advice to intending intensive poultry-keepers thus: "Do not overcrowd; the minimum ground space should be 3 square feet per bird, and the roof should be well raised. Especially must this point be observed in the larger houses, where the roof is a fixed one and not opening and adjustable as in the smaller types. The litter of the houses must be kept absolutely dry and constantly spaded or raked over once a day, and excrement removed. The dropping boards should be scraped clean each

The same House with Rain-shutter Down, Birds Scratching in Litter. Note the Net Bag for Green Food Suspended from Roof.

Range of Small Coops for Housing Young Stock at Mrs. Baynes's Farm. Also Useful for Moulting Hens.

mornings, and removed outside to manure; the sprinkling of a little dry sand or earth thereon before replacing at night will assist cleanliness in this respect.

"If on entering the house any smell of ammonia is detected, it is a sure sign that the litter is damp, and if still present after a thorough raking and cleaning, the litter must be removed and fresh supplied. I consider this absolutely necessary, and in order to assure dryness, and also save cost of frequent renewal of litter, I strongly recommend the use in all houses of boarded floors raised at least 6 in. off the ground. In these ways, and by using suitable litter, the latter can be constantly sifted, and so kept thoroughly clean, and treated thus will keep sweet and good for six months at a time without needing renewal. All houses must be open-fronted with shutters for bad weather protection, and stuffy houses avoided at all costs, for they are prolific causes of disease."



A Small Intensive Breeding Pen for Ten Birds. The Nest Boxes are at Back, the Adjustable Roof is Raised, and the [illegible] is [illegible] in Front.

As to litter, Mrs. Baynes first used a depth of 2 in. of *dry* sand or sand upon the board floor, covered by about 3 in. or 4 in. of wheat chaff. She found this an excellent scratching material, but for some time past has utilised [illegible] in place of the chaff, as less subject to damp in our moisture-laden atmosphere. Other intensive poultry-keepers use instead whole straw bedded fairly deep, the birds in their vigorous scratching soon breaking up the straw into short lengths, and it is held for this system that the droppings falling through are more *easily removed* than on material of shorter length. We [illegible] mowings, pea haulms and dry leaves, combined with dry sand, all with equally good results, the one great point being that the litter is *dry*, the reasons for which are well set forth by Major

Falkner's notes. Peat moss litter we have seen condemned by some writers, but after a year's exhaustive trial in our house we found it quite satisfactory, and its deodorising properties were excellent. Here again, as also with soil used alone and renewed at intervals, we found that the whole secret was *dryness*.

Another point in hygiene to be remembered is periodical cleansing and disinfecting of all houses and appliances, and care in seeing that birds are free from insects. If these pests are detected, an occasional thorough dusting with insect powder of the birds themselves, especially round the head, neck, vent and under the wings, is advisable, and the nest-boxes and crevices of the houses can be treated in the same way. The addition of new birds to the stock should be effected with care in this respect also, and, to avoid any risk of introducing disease, the new-comers should always be given a few days' preliminary quarantine. Fresh birds should always be put into a house at night to avoid sparring, and should one bird be attacked, a judicious application of a solution of bitter aloes and alcohol on the parts affected is generally successful against further onslaughts. The same remedy is also useful in cases of feather plucking, which sometimes crops up at moulting time and amongst young stock.

Intensive Feeding.

Upon feeding there are almost as many theories as there are poultry-keepers, and the rations must naturally vary with the time of the year and the condition of the stock; but, broadly speaking, Mrs. Baynes says that the best feeding for intensive purposes is as follows:

"It must be bulky, whatever it is. In grain I prefer small, sound wheat or oats or cracked maize (this latter very sparingly, for it is too fattening); I use plenty of bran, and give more meat than is usual to birds on free range. Also green food freely, such as lawn clippings, cabbage and lettuce leaves when obtainable, and clover-hay, turnips, swedes, mangolds and sprouted oats in winter. More food is certainly required than for birds on open range, but it must be given in small quantities so as to keep the birds employed. The greater danger to avoid is that of the fowls getting too fat, when they quickly get lazy and liverish. I feel sure that dry mash will be the food of the future for intensive work, as, if given regularly at stated hours, the birds cannot become too fat and yet get all that they want, and will go to roost, as is good for them, with their crops crammed. In this connection, where wet mash is used, it should only be given as the last feed of the day. Overheating foods must be strictly avoided under usual feeding conditions.

"In feeding fowls in close confinement, my ideas are: (1) To make them work hard for their food; (2) to feed bulky foods; (3) to always keep laying hens just hungry enough to be always keen on their food; (4) to judiciously use fat-forming foods; (5) to give variety in food. The daily routine, if wet mash is used, is to start with a feed of corn buried deep in the litter at 7 A.M. (the late riser can rake this in overnight); 11 A.M., another light feed of corn raked in; 1 P.M., green stuff—if loose leaves, suspended in net bags; if turnips or mangolds, cut in half and hung up for the birds to peck at; 3 P.M., a little more corn in scratching material; and the last feed, half an hour before the birds go to roost, is a mash given in troughs, as much as they will clean up. The allowance of grain per bird is about 2 oz. each day, divided over the three feeds, which are varied necessarily in time according to the season of the year. The water supply must be changed frequently, and so placed that it cannot be soiled by the birds' scratchings.

"I have found, however, after considerable experiment, that dry mash feeding gives decidedly the best results in every way, particularly as regards the 'hatchability' of eggs. I have therefore entirely discarded the wet mash feeding, except for table birds. My present daily routine is as follows: First feed to consist of green stuff, of which the birds should be tempted to eat as much as possible. Second feed, one heaped tablespoonful of grain per bird well raked into the litter about 10 o'clock. Third and last feed, the hoppers containing the dry mash are put in the houses between 1 and 2 o'clock and left in till roosting time, when they are removed. I think the intensivist will find this quite the simplest way of feeding and a great saving of labour." (*See also p.* **xx.**)

As to the breeds most suited for such close confinement, Mrs. Baynes says: "For choice, White and Black Leghorns, and particularly the former, which do admirably under the system, and become very tame and docile. I have also done well with Buff Orpingtons and White Wyandottes, and I think there are few breeds which, if judiciously managed, would not give satisfactory results." To this we may add that we have had excellent results from White Wyandottes, and very fair from White Orpingtons, and, properly treated, almost all the popular breeds should do equally well.

On the moot point as to whether breeding stock should be kept intensively, Mrs. Baynes says: "It is too early to speak definitely about results in England, having experienced both good and bad results. If adopted, the male bird should be rested frequently, and not left in the pen continually. I am inclined to think that correct feeding is one of the most important points, and would advise the use of cockerels rather than cocks, and light breeds undoubtedly have yielded the best results hitherto. Here, again, my best results have been since using dry mash."

Mr. Herbert Jackson's Small Intensive Houses, Incubator House and Corn Store, showing the Adaptability of the Intensive System to a Small Area.

Summing up the intensive system, Mrs. Baynes says: "Where properly carried out, the birds keep in excellent health, but like every other system it has its advantages and disadvantages. One of the latter is the occurrence of egg-eating, but careful fixing and making of nest-boxes I have always found an unfailing cure for this if taken in hand at once; and, failing this, the ordinary remedies prescribed in this work can be adopted to cure the vice. Some of the advantages are plenty of eggs with delicate flavour, owing to constant pure food and water, less trouble in attention to stock, and, provided dry mash is used, much less labour. The stock are all close at hand, and weather conditions are practically neutralised, and more eggs can be obtained when 'eggs are eggs' at 2s. and 2s. 6d. per dozen. The birds are kept much cleaner, and, if exhibition birds, are also well shaded and moult quicker. The outlay at first is undoubtedly larger than on open range, but much less ground is required, which means less rent, and thus enables you to have your poultry farm within easy range of any town, where, if much land was needed, rent would be a heavy item, and the houses, if expensive at first, are substantial and lasting."

Mr. Herbert Jackson's Intensive Farm.

Very similar are the experiences related to us by Mr. Herbert Jackson, of Machynlleth, whose acquaintance we were fortunate enough to make whilst touring Wales in the spring of 1913 with the Egg and Poultry Demonstration Train. Writing to us at the end of 1913 Mr. Jackson said:

"I send you photographs of my intensive poultry farm, which is built in my garden, and proves to the people that poultry and a garden go well together. I have been very successful, as I started in 1912 and now hold a stock of 300 birds, of which all except a few were reared on the ground. I have four incubators, capacity 500 eggs, and hope next season to have a stock of 1,000.

"I started in March, 1912, with a few White Wyandottes and White Orpingtons, and as I had no land I had to build my hopes on the new system (the intensive) by building two colony coops to hold six each. I found this system so successful both for getting a good supply of eggs and for keeping the birds clean and healthy that I have extended it, so that my plant now consists of fifteen houses to hold 250 layers, besides incubator house (500-egg capacity, four machines) and corn store, and all in my garden.

"You will see by the photograph how they are placed. There is no difficulty as to getting eggs in winter, as I get more then than in summer. My next move is to build on half an acre some large intensive houses to hold 100 birds each, which I am going to rear this next season, and so increase my stock tenfold. I reared my young stock this season on a quarter of an acre adjoining my house, and when four months old the young birds all go into intensive houses for stock or table birds.

"I use for scratching material dry leaves, road dust and chaff, which cost next to nothing. I feed on soft food in the morning, green food at noon, and small grain at night. I feed my layers at a cost of 1½d. per head per week, and can fatten chickens at an average cost of 1d. per head per week from birth until four or five months old."

Mr. Jackson's system of feeding, it will be noticed, is less elaborate than that of Mrs. Baynes, if wet mash is used, and, with the exception that we give the soft food or mash at night instead of in the morning, is what we have found work very well for three years on an experiment conducted by us on intensive lines in our own garden. Our object was to test the effect on the general health of birds kept under such close confinement, and though necessarily, owing to our business duties, the bulk of the attention to the birds fell to gardeners and others hitherto altogether unskilled in poultry-keeping, we must confess that we were agreeably surprised as to the results obtained in this direction, and also as to the number of eggs secured during the winter months from birds thus penned up.

Experimental Intensive Plant in the Editor's Garden.

In order to show that it is not essential to scrap existing houses to test the system, we give a photograph above of our experimental intensive plant, only one of the houses in which is of true intensive type, viz. that in the foreground. The older types of houses in the background have yielded equally good results, and are certainly easier to work and clean out, in our experience, than the more up-to-date small type. They, however, occupy more room, give less proportionate scratching space, and are necessarily initially more expensive, and thus are not those which we should advise a beginner to build. On the whole, we think that the two houses of the type used by Mrs. Baynes (*see photographs on p.* viii.) are the easiest to work, giving fair head room, and thus avoiding the tiring bending over and lifting out of dropping boards, etc., entailed in what we are apt to style the "rabbit-hutch" type of small house, necessary though these may be for small breeding pens or young stock. Economy of labour and ease in handling lies, we are convinced, in moderate-sized flocks in such houses, which in a sense are akin to being compartments of the large intensive houses to which we must now allude.

Large Intensive Houses.

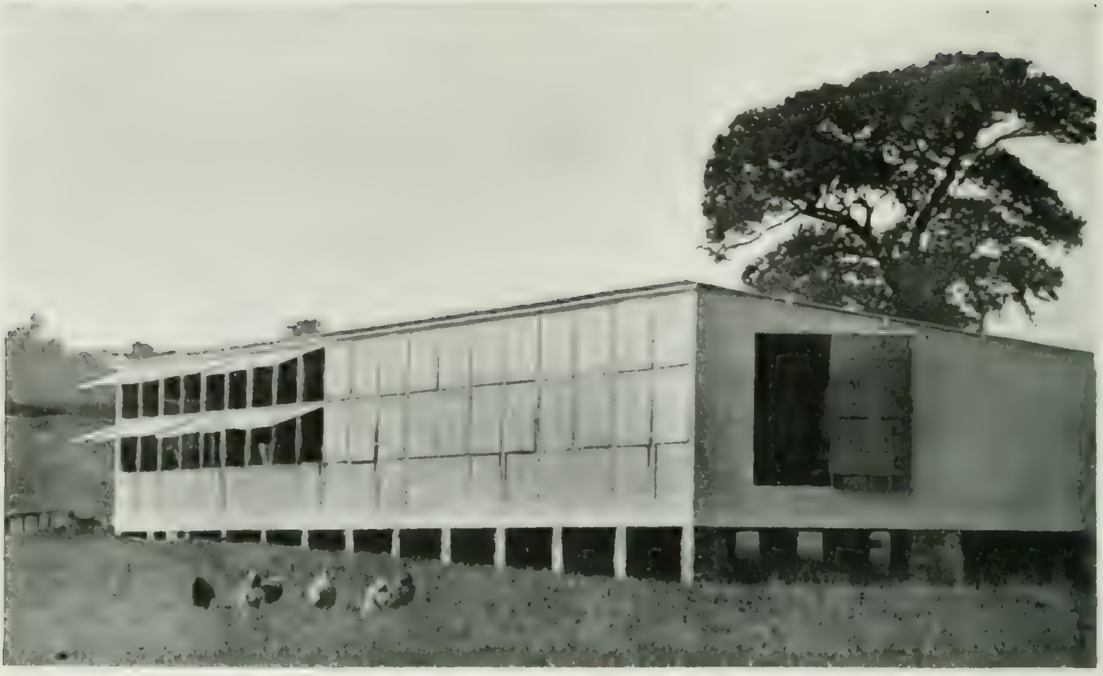
As the backyarder's covered-in scratching shed and the fancier's roomy exhibition pen may be said to have been the forerunner of the small intensive house, so the large winter laying houses common in America, and not unknown in this country also, were the ancestors of the modern double-decked intensive house, ranging up to as high as 3,000 birds under one roof. The principle of so wintering live-stock is common to agriculturists, and has been adapted to poultry with excellent results. A capital example of this type of house was one which we visited early in 1912 on the poultry establishment of Mr. Martin Burnham, at Cranbrook Common, Kent. It is built to accommodate 500 hens in two flocks, and at the time of our visit held about 300 healthy scratching occupants.

This house is best described as practically open-fronted, being boarded up 2 ft. from the ground with wire netting above that, over which canvas shutters can be dropped if necessary to keep out driving rain or snow, and thus keep the floor *dry*, that essential factor to success in all intensive poultry-keeping. From a height of 7 ft. 6 in. in the front, the roof slopes to 4 ft. 6 in. at the back, the depth of the house being 18 ft., with a total length of 100 ft. These dimensions of height and depth Mr. Burnham has found by experiments to be best suited for light and air in houses of this kind. Along the whole length of the back of this shed runs a wide shelf, serving the purposes of a dropping-board beneath the low perches, which is kept scrupulously clean and dusted with lime daily. Very noticeable in this big house was the total absence of smell, due to the ample air-space and splendid deodorising properties of the dry peat moss litter with which the house was deeply bedded, and into which all corn given was well raked so as to give the hens ample exercise. On this establishment bran is always kept before the birds, and alfalfa is largely used as an addition to the ordinary mash for laying hens.

It is an easy transition from a house such as this to the modern double-decker, the largest of which, capable of holding 3,000 hens, is on the Hamworthy Intensive Poultry Plant. This we have not seen, but have personally inspected the well-known establishment of Mr. C. A. Potter, at Ferndown, near Wimborne, whose two double-deckers, with a capacity for 1,000 hens each, are shown in the photograph on p. v., and are remarkable structures. They were described by us in *The Feathered World* of October 24, 1913, and we venture to repeat the notes as of interest, though it must be remembered that these and other large houses have not yet been running long enough for a definite conclusion as to whether, for large plants, this particular form of house will or will not supersede the smaller separate houses with or without outside runs.

Ferndown is a scattered hamlet midway between Wimborne and Ringwood, on the borders of the New Forest, and within easy reach of an excellent market for eggs and chickens in Bournemouth, and this factor means much to a utility poultry-keeper. The farm was started in 1912, and, we understood, had so far justified its existence that the erection of a third house was under contemplation. Mr. Potter resides with Mr. and Mrs. Potter, sen., and his sister, all fortunately keenly interested in the enterprise, for three years of experiment with small pens of fowls on the intensive system have taught us the absolute necessity of scrupulous personal attention on the part of whoever takes up this side of poultry-keeping; for, whilst it has great attractions, since it makes the question of weather to a personal extent a negligible quantity, it has always great dangers lurking for the careless or slipshod attendant.

We started on our tour in a small lean-to conservatory, which was stacked up with boxes of oats in different stages of sprouting; some twenty boxes of these are used every day, and the stage at which Mr. Potter has found it best to give them to the fowls is when the green sprouts are 1 in. to 2 in. high. Other green food, in the shape of kale, cabbage, etc., is given, for sprouted oats, excellent



One of the 500-Hen Semi-Intensive Houses on the Molassine Co.'s Experimental Farm at Twyford.

as they are, do not supply the mineral properties of crops grown in earth.

The double-deckers illustrated on p. v. are erected facing south, and a sheltering belt of fir trees keeps off wind. The soil is a silver sand on clay, and thus, whilst below there is a good deal of moisture, the surface drains well, and there is an abundant supply of dry, clean sand available as floor covering for the houses beneath the whole straw litter.

The two houses are each 100 ft. long by 16 ft. deep, and arranged in two floors, each divided into ten compartments, 20 ft. wide by 16 ft. deep, to hold fifty birds each. The front on each floor, as can be seen, is partly boarded up below the wire-netting, to which double canvas shutters are provided. The ground floor is raised 18 in. from the soil, so as to be thoroughly dry, and as a preventive against vermin. The height of the lower compartments is 7 ft. throughout, and that of the upper storey 7 ft. 6 in. in front, sloping to 4 ft. 6 in. at the back.

Food and water-vessels are raised well off the ground, as are also the nest-boxes, so as to allow the whole extent of the floor for scratching purposes. The perches run longitudinally above the nest-boxes, which are 15 ins. off the ground, with a dropping shelf beneath them, from which the manure is collected daily. Whilst eggs can be taken from the nest-boxes from the front, the birds enter from the back, so as to give greater seclusion, and also as a partial preventive against egg-eating. An ingenious device is gradually being fitted to all the nest-boxes in the shape of a plaited concave straw nest, with a centre aperture, through which the egg, when laid, rolls away below on to the well-littered floor of the nest-box, out of reach of a possible egg-eater.

Trap-nesting is not adopted here, but a careful watch is kept on each flock and their record. The stock is a mixed one as regards breeds, and as eggs are the sole object, the hens are sold at the end of their second season, in time for the Jewish festivals.

In making contracts for the supply of eggs a guarantee is given that no egg shall be dispatched more than twenty-four hours old, and by watching the quality as well, as much as 3d. per dozen above the market rate of the district had been secured, the price early in October being 1s. 6d. per dozen. This is an item of importance on the year's turnover.

The manure, too, we learnt, was a considerable source of revenue, all procurable from the dropping-boards being taken at a good figure by a market gardener, as were also the sweepings from the floors, which are relittered half-yearly, the total amount realised for manure being estimated at over £100 per annum.

The tour of the twenty compartments (ten to each floor) of these formidable-looking double-deckers naturally takes time; but the working had become so systematised that Mr. Potter and his father then felt equal to the attention of another 1,000 birds without making the labour too arduous. Hardy young stock reared on farms were then being used, and we thought advisedly so as not to add the dangers and troubles of intensive rearing to the work. Every precaution is taken against disease, and ailing birds are promptly eliminated. This risk of wholesale infection seems to us to be the danger-spot of these huge colony houses, and their success in this respect greatly depends upon being able to anticipate disease before it gets hold of a bird.

SEMI-INTENSIVE HOUSES.

Another interesting plant of the large flock description, which we also visited in 1913, is that of the Molassine Company, near Twyford, where, on a large experimental poultry farm on the extensive system, this firm also installed three houses on the intensive system, each to hold a flock of 500 birds.

These houses are situated a hundred yards apart, with ample land around each, so that they can also be used as semi-intensive houses by allowing the birds their freedom in fine weather, and this is the plan now adopted. The houses are 100 ft. long, 16 ft. deep, and the roof at the front is 7 ft. high, sloping back to 4 ft. 6 in. at the rear. The eaves overhang, and two tiers of canvas shutters provide shelter against cold winds and driving rain or snow. The floor is of wood, and the houses are raised on brick piers, varying in height, owing to the slope of the ground, from 1 ft. to 4 ft., thus allowing ample air-space beneath to avoid moisture from the ground, and also incidentally affording capital dry storage cover for spare coops and appliances as well as litter.

The internal fittings are: (1) Nest-boxes at the back of the house, with entrance from behind, so as to ensure privacy and a certain amount of darkness as a first preventive against egg-eating; (2) two rows of perches, arranged on a shelf above the nest-boxes, running longitudinally down the house, but ending short of the side walls, so as to avoid crowding into the corners; (3) the floor bedded fairly deep with long straw and the usual water and food troughs.

Experience here, as in many such houses recently visited, points to the subdivision of these large intensive houses into several

Interior of one of the Molassine Co.'s Semi-Intensive Houses at Twyford.

compartments, and also a rearrangement of perches, from one or two long ones lengthways to a number of short ones crossways, so as to avoid crowding at roosting-time.

The labour entailed in feeding and cleaning the houses will, of course, be more, but the greater ease with which the approach of disease can be detected and warded off (and in that appears to lie the secret of success for the intensive poultry-keeper in our treacherous moisture-laden climate) will more than compensate for the extra trouble of the smaller flocks. Moreover, it is thought that a better record can be kept of laying where trap-nesting is not adopted, and also that vices like feather plucking and egg-eating can be more readily detected in these smaller colonies than in the very large flocks, interesting though it may be to see 500 fowls busy scratching in one group on a well-littered floor.

Some Experiences.

Asked as to experience of the intensive system, we were told that the two worst evils which had been encountered were a temporary epidemic of roup in the previous winter and a bout of egg-eating in one flock of hens. The first evil had been successfully overcome by assiduous attention to the birds and applications of the usual remedies; and the second, probably caused in the first instance by a few soft or thin-shelled eggs becoming broken, had been combated by frequent collection of eggs laid, paring the beaks of offenders, and the leaving about for the fowls of eggs, for the usual contents of which bitter aloes had been substituted. A change of green food, also, from rape, of which the birds soon tired, to cabbage or swedes, was also found beneficial in this respect.

Such a plant as this is, of course, not strictly speaking intensive, but semi-intensive, and is interesting thus as illustrating a transition which has taken place on several large utility poultry farms where the new strictly confined methods after experiment have given way to the older system of allowing the inmates of these large houses free access to outside runs, or, as in some instances, only when the weather is fine.

Mr. T. W. Toovey, of King's Langley, whose farm is further alluded to on pp. 154 and 155, is one of those whose experiences have caused him to believe in the benefits of reversion to older methods, and when visiting him in the autumn of 1913 he was very outspoken on this point. Whilst granting full force to the arguments of his intensivist critics that Mr. Toovey did not give their system the best chance, owing to his use of cement floors to his houses (always a source of damp in our climate), and somewhat scanty litter, the experience of so practical a poultry-keeper as Mr. Toovey is interesting, and we are glad to be able to illustrate his houses.

There are fifteen of these, open-fronted at the top half, with wide overhanging dripboard and canvas adjustable shutters above the glass, and wood front below, and with doorways and windows at the sides. In size these measure 30 ft. long by 20 ft. deep (intensivists usually restrict the depth to 16 ft.), and in height they range from 9 ft. 6 in. to 5 ft. at the back (as against 7 ft. and 4 ft. 6 in. in the usual intensive houses). From the additional height in front the increased 4 ft. of depth does not appear a serious fault of construction, for on inspection light and air appeared to travel well to the back of these sheds.

Each of these houses is built for 100 birds, which are let out on alternate sides of their house into large grass runs, in which every precaution is taken against the ground becoming foul by taking a crop of hay annually and by resting and also grazing. For disinfectant purposes the houses are periodically dressed with a solution of 1 in 16 of crude carbolic.

Mr. Tom Barron, of Catforth, near Preston, is another thoroughly practical utility poultry-keeper, who, from small beginnings, has built up one of the best known farms in this country, and made a speciality of laying strains. His experiences, then, are not to be lightly discarded, and visiting him in August, 1913, we were fortunate to secure these, which are as follow:

"A great deal has been written during the last two or three years about intensive poultry-keeping. Some people swear by the intensive system, whilst others state that it does not pay, and that the semi-intensive plan is best. As a practical poultry man, with an experience of the semi-intensive system for a good many years, I agree with the latter.

"In starting large housing, my idea was to keep a greater number of birds together in one flock. I thought it would be cheaper to build for a large number than it would be for a similar number in smaller houses. But no one would imagine the trouble and loss I had to contend with in my first experience of housing large numbers in one flock. I had practically all my birds infected with roup and other diseases, although roup was, I found, the greatest enemy to contend with.

Mr. Toovey's Semi-intensive Houses.

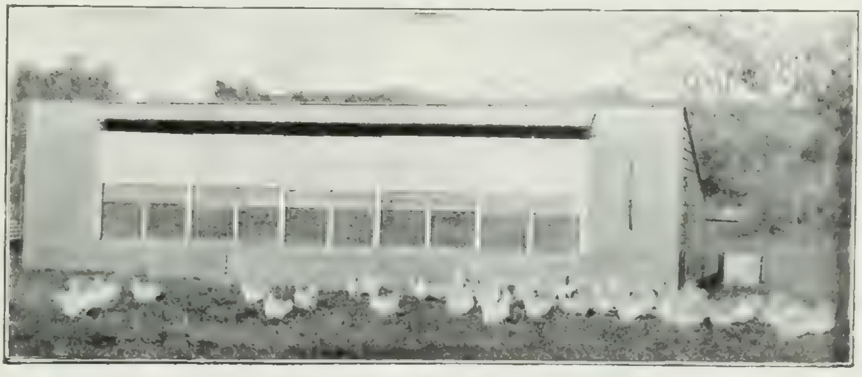
"Now, in my opinion a man must never attempt housing in the very large house unless he has had many years of practical poultry-keeping, because the very first thing that would happen would be that the birds would have roup, and the great point then is knowing the moment the birds are infected, and using the right remedies to cure them. If this dreadful poultry disease is not checked in its first stages, it will probably practically beggar him. I have tried both the little-run system and the large intensive house, but to-day, if I were going in purely for eggs, and not for selling sittings for hatching purposes, I would certainly build the large house; but, mind you, I say again a man must know his business. This house would be the semi-intensive and not the intensive system.

"Perhaps I might give a little of my own experience. In 1912 I put 400 layers into my semi-intensive house, and, keeping it entirely closed up, made it fully intensive, and thought of doing great things, as I had read a lot of correspondence in the papers, and imagined the system quite feasible. The birds did very well indeed for three or four months, then I found they began to ail—something like pining it was—and gradually lost colour and condition; their combs turning quite white. However, I thought I would persevere and master this intensive plan, but at the end of six months it was necessary to turn the birds out, or they would have all died. Some were lost as it was, and I thought it quite time to give up, all the birds having gone off laying.

"I then went back to my old plan, which had been used for about nineteen years. This was turning the birds out when the weather was fine—all day if the day was suitable—and closing them up at night. On a rainy day I would keep them up until the weather and runs were suitable; if snowy closed in all the time, and if frosty kept up until the air seemed suitable; then out they would go, if only for an hour. The birds were, of course, fed inside the house all the time, in our usual way with the large flocks. And, in my opinion, it is this semi-intensive system that is best in Engand, and in any other country if tried, and the other plan I do not consider will stay.

"After I had let the birds out day by day for about a fortnight, they had got into the best of condition, and I had an abundance of eggs from them. This proved to me conclusively which plan was right.

"This house, which has since again been used as a semi-intensive house, is 72 ft. long, 18 ft. wide, and 18 ft. to eaves. It has a span roof boarded underneath, and with corrugated iron covering this woodwork. In the south wall it is fitted with shutter windows, which, by means of ropes and pulleys and counter balance weights, can each be lifted or let down at will, according to the weather and time of year; the openings being covered with wire netting. This makes the south wall an open front the whole length. A storm screen, 3 ft. wide, is fixed outside the building just above these windows, keeping out the rain during close but wet weather, and checking the power of the sun's rays into the house.


Front View of One of Mr. Toovey's Houses.

"The nest-boxes, thirty-eight in number, are just below the windows, and the size of each is 14 in. each way. The tops of the nests slope sharply from the wall to the front, which keeps the birds from using these as perches.

"On the opposite side of the house is a dropping-board, running the whole length of the building, 5 ft. wide and 2½ ft. from the floor. The perches, 1 ft. above this board, and themselves 3 in. deep, are arranged along the entire length, but transversely, not lengthwise, being 18 in. from centre to centre. I find very long perches incline the birds to crowd together, and after getting overheated they get chilled. Being split up, as they are, into forty short perches, across the dropping-board, distributes the birds more, and the ample space between the perches keeps them from fighting, and being all one level has the same satisfactory result.

"Every 12 ft. this dropping-board, with its perches above, is divided up by partitions from the floor to the square of the house, and the space above being lathed over and covered with straw, stops side down draughts to the birds on winter nights when perching.

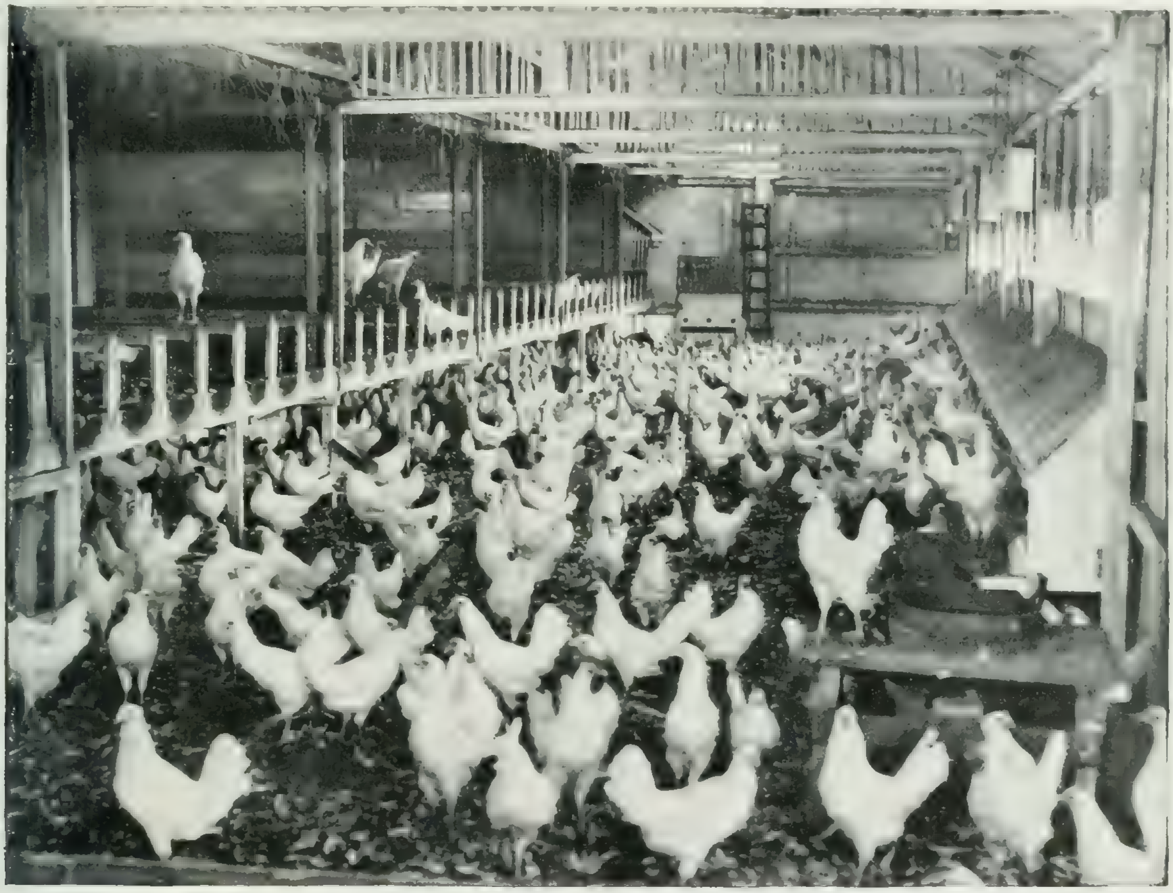
"At each end of the building is a large door, running on overhead pulleys, 8 ft. wide, which allows of a horse and cart passing through from end to end, for cleaning and other purposes. The building and floor is well lighted from the roof with twelve windows let into the wood and corrugated iron above it, these being 3 ft. by 2 ft., also in the gable ends and close to the floor, under the dropping-board in the north wall, by fourteen windows 20 in. square, so that the birds can easily see to scratch out their food from the litter, in which the grain is always thrown. The litter is always 2 in. to 3 in. deep.

"The water is contained in two large piggins, which are mounted on platforms to keep out the scratching litter, and these are entirely emptied, scrubbed out, and refilled daily. The mash, given towards evening, is fed in the troughs standing directly on the floor, but the green feed of mangolds, turnips, and cabbage for winter-time is put into specially made troughs, trestle formed, with a standing board on either side of its length a few inches from the floor. In addition to the dry and mash feeds, the birds always have before them grit and shell.

Exterior of Mr. Tom Barron's Large Semi-intensive House with Fowls at Liberty.

"The floor of this building is raised about 6 in. above the ground level outside, and is covered with asphalt. It would perhaps interest readers to know how this floor was made. About 20 tons of cinders were put down. These were rolled and rammed until the whole was hard and level. When in perfect condition, about 4 tons of asphalt were laid over to about the depth of 1 in., and hardened, and a fine layer of cement gave a finish to the surface. This is one of the best floors I have had on the farm.

"The runs are on both sides of the building, and are reached by the birds through the glass windows near the floor, one at each end of the north wall sliding back when required, and two similarly in the south wall. The runs are divided in a line with the house, and the birds can thus be turned into either run as desired. These grass runs are used alternately, say when the birds have run a week or so on one side of the house they are turned into the other. This allows the runs to freshen.



Interior of Mr. Tom Barron's Semi-intensive House.

"As I have previously stated elsewhere, I do not think a great deal of land is needed to a house like this, because the birds are for a greater part of the time in the house itself. An acre with this size of building does very well indeed. The house and the system are the great points, not the amount of land.

"The menu for the semi-intensive layers is as follows: In the morning we feed a mixture of oats, wheat, split Indian corn, a little coarse wheat—say a decent sample of cockle—a few split peas, and perhaps a little dari. The more kinds of grain fed, in my opinion, the better, as it keeps the birds at the feed. They like change. This is well mixed, however, before being given to the birds, and is then thrown into the litter and raked amongst it. The litter is cut straw, chaff, or peat moss. There is also constantly before the birds a bran hopper, in which is a mixture of one part ground oats and three parts bran. At dinner-time we give, perhaps, a little more of the morning mixture—not a feed, but just a little to keep the birds working. By this means they are prevented from standing about on one leg and catching colds, as they would do with a warm, wet mash in the morning.

"Towards night we feed, in the troughs, a mash composed as follows: One-third part bran, one-quarter part thirds or middlings, one-quarter part biscuit meal, one-eighth part meat meal, such as fish meal or granulated meat, about one-eighth part clover meal or alfalfa meal, changing the thirds sometimes for ground oats. This we mix with water from the large boiler, in which we have already steamed a few bucketfuls of whole oats. The whole is well mixed in the mixing trough, until a good mash, crumbly, but not sloppy, is made, and this is taken to the birds in the wheelbarrow.

"We give the birds as much as they will possibly eat at night, and if there is a little left overnight we do not mind. In my opinion they should leave a little of the night's feed. There is not so much danger of the stuff going sour in large flocks of birds like these. They are not easily overfed. But the great point is to give them sufficient in proportion to the smaller flocks.

"My idea is, that the profit from such a house, with such treatment, should yield £100 per year; this is allowing for depreciation of the house and birds and rent, but not including the proportion to be debited to attention. This is my honest opinion, and I have tested it now for some years. In conclusion, I do not want readers to run away with the idea that the semi-intensive system is something quite new; it has been given a twenty years' experience by me and is English. Providing a man will do all that I have set forth, and take off his jacket to it, he will get on all right, but it is no use the lazy man attempting the business, for it requires attention every day—Sunday as well as week day."

Some Conclusions.

A statement such as this from so experienced a poultry-keeper as Mr. Barron naturally attracted considerable criticism, and a reply by Mr. Meech, in his paper on Jan. 14, 1914, took grave exception from the intensivist point of view to these criticisms. Briefly put, these objections were to the effect that for intensive purposes Mr. Barron's house was not suitable, being wrong in construction, deficient in light and ventilation, and for the number of birds (400) had, instead of four square feet for each bird, but a fraction over three feet. Mr. Meech condemned the apex type of house and the size of the flock of birds placed therein, maintaining that with smaller flocks of 100 at most, and a better arranged house, Mr. Barron's conclusions would have been different.

Such points are, of course, quite fair to advance, but we think from our visits to several of these great utility poultry-farms, including the well-known Worcestershire Poultry Farm, and the experiences already cited, that for them the semi-intensive method is the better. The large and varied head of stock carried, the fact that ample grass run is usually available, and that the big staff of helpers necessary does not admit of that minute *personal* attention to detail which seems such an essential feature of the purely intensive system, all tend to the conclusion, as they themselves appear to have found, that for them the older method is the better course.

Such a conclusion can be arrived at without in the least disparaging the utility of the intensive system for egg and table chicken production, as indicated earlier in this chapter. For breeding purposes it will always be well to have stock available bred and raised on free range systems until more exact information is forthcoming as to the effect of close confinement, and purely artificial feeding on several generations of intensively bred fowls. It has been stated, we know, that neither health nor constitutional vigour suffers even to the tenth generation of intensively bred poultry, but until exact comparisons can be instituted and results scientifically tested, it appears better to go by human analogy, and just as most statesmen deplore the growth of a town-bred nation as opposed to one of the sturdy yeoman type, so we may conclude that young stock reared under healthy, open-air conditions and free range will make better material, both for intensivists and semi-intensivists, than others bred and brought up in confined and purely artificial surroundings.

Within these limitations, and with a wise regard to the general principles of poultry-keeping laid down in the other chapters of this work, there seems little reason why the intensive system, especially as applied to back-yards and suburban gardens, should not add thousands of successful recruits to the ranks of poultry-keepers.

For the benefit of beginners we conclude this chapter with notes from a well-known writer on utility poultry of a dry mash suitable for fowls kept intensively for egg production:—

"A useful mixture is one measure of pea or bean meal, four measures of sharps, one measure of maize meal, four measures of ground oats, one measure of fish or meat meal. The above is described as the 'stock mash,' and to one measure of this stock mash should be added two of bran and two of clover meal when it is ready for feeding. The feed is supplied in hoppers, which may be closed or opened at will by the attendant, and the birds should have the run of these hoppers about two hours per day."

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WRIGHT'S BOOK OF POULTRY

INTRODUCTION.

MR. LEWIS WRIGHT AND "THE BOOK OF POULTRY."

By S. H. Lewer.

MR. LEWIS WRIGHT was the son of a well-known printer and publisher in Bristol, and it was at the early age of nine, towards the close of 1847, that, in conjunction with a brother, young Lewis first engaged in poultry-keeping. The difficulties in the way were considerable, for there was but a small stone-paved back yard to their father's town residence. Still, a start was made, and three of the coarse Minorca hens then so common in the West Country, together with a cock, formed the stock of the young fanciers. The birds were of the hardiest description, and capital layers, though they did not breed too true, for the progeny showed signs of other than pure Minorca blood. These chicks, however, were the delight of their young owner's heart—for the brother soon tired of the hobby—and Lewis Wright used to watch them by the hour, until, as he told me, "I could almost have acted a chicken myself." This close observation of their ways and individual peculiarities, doubtless cultivated a quickness of perception which stood Mr. Wright in good stead in later days.

An Experiment in Socialism

It was about this time that poultry shows were beginning to be held, and Mr. Wright often told me of the admiration kindled within him by the first really representative gathering of poultry which he visited, and the sense of dissatisfaction caused thereby at the scarcely exhibition, although hardy, character of his own stock. The next move was an attempt to realise an ideal of some present-day reformers—the holding of all things in common—and occurred through Lewis being sent to a day school. His schoolmaster was a kind-hearted man, who approved of pets for his scholars, and consequently had allowed the boys to construct a hen roost in his coal-cellar. Towards the providing of inhabitants for this curious fowl-house it was by mutual consent arranged that each boy should contribute a hen. This was duly done, but somehow or other the big boys' hens did all the laying, and Mr. Wright found that his first and only experiment in Socialism did not favourably impress him with the system; for under it, even the laying qualities of a well-tried strain seemed to dwindle and decay; since apparently never an egg did his hen lay after her admittance to the co-operative hen-roost.

Breeding Brahmas

Upon leaving school the demands of the printing business and some scientific studies left but little time for attention to poultry, and so for a while these were renounced, and it is perhaps doubtful if the hobby would have been taken up again had not Mr. Wright found on his marriage, at the age of twenty-six, that his wife, accustomed to country life, wanted a few hens, so as to ensure a supply of really new-laid eggs. Again the old stone-paved yard was called into requisition and the abandoned interest renewed, and a year subsequently, on removal to Kingsdown, Mr.

Wright was more conveniently situated for poultry-keeping, and bought his first dark Brahmas (claiming a pair of pullets, h.c. at Birmingham, and getting a promising cockerel from the Rev. Jas. Ellis, of Bracknell, Berks). With these birds (chickens were then often shown in pens of a cockerel and two pullets) Mr. Wright took first at Bristol, then one of the leading shows, beating Mr. Boyle, whose Brahmas at that time were at the height of a successful show career, and so under favourable auspices made his *début* as an exhibitor.

In an interesting article contributed in 1893 to *The Feathered World* Mr. Wright graphically described the Brahma fowl of nearly thirty years before, showing in what respect it differed from the type of bird then in favour, giving also the sources from which he built up a strain of dark Brahmas of which he had cause to be proud. To the end my old friend deplored the fact that the later development of the Brahma was not on Indian rather than Cochin lines, contending that with lighter plumage and activity of form the genuine utility properties of the breed would have been preserved.

During this period it was that Mr. Wright, on the pressing request of Mr. James Long, took his first and last judging engagement. The occasion was the Plymouth Show, and history has it that the sponsor of the judge was amongst the keenest of his critics after the awards were made. It was not this, however, which deterred Mr. Wright from accepting the numerous judging engagements which were subsequently pressed upon him; but the feeling that the exercise of judicial functions was inconsistent with his hobby as a breeder and an exhibitor, and, later on, his duties as a reporter and editor. Whilst on the subject of reporting, it is interesting to note that probably the first *detailed* report given of a poultry show was from Mr. Wright's pen, and appeared in *The Journal of Horticulture*, from which paper its author held a sort of retaining brief conditional upon his sending its then editor, Mr. Johnson, such notes as he might consider of interest. Needless to say, the descriptive report caught on, though, with the multitude of shows now held, it has added enormously to the difficulties of the Fancy Press

Evolution of "The Book of Poultry"

Towards the close of the 'sixties a series of articles on poultry-keeping was appearing in *Cassell's Family Paper*, the unpractical and unreliable nature of which roused the ire of our enthusiastic fancier. The papers were principally translations of a French work full of many since exploded myths as to the gigantic systems of poultry-farming then existent (?) in France, and the huge profits to be reaped from an English imitation of the same. Mr. Wright drew Messrs. Cassell's attention to the danger of such articles, and the outcome of the matter was his writing for them "The Practical Poultry-Keeper," a handy, concise little work, of which nearly ninety thousand copies have been sold. This book was followed by "The Brahma Fowl," a masterly treatise on that breed, with coloured plates, which ran through several editions. The appreciation of this latter work was such that many requests were received from fanciers for similar monographs on each of the then known varieties of poultry, and from this seed afterwards sprang its author's best known work, "The Book of Poultry."

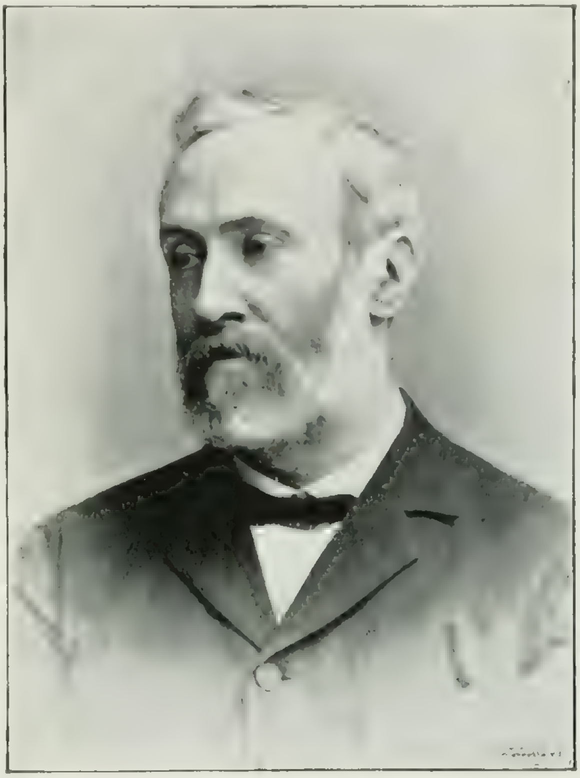
Success as a Breeder

Meanwhile, despite literary and business distractions, the birds were not neglected, for Mrs. Wright developed into a keen fancier, and so proved a true helpmate to her husband in his hobby. Even at Kingsdown space was very limited, only 60 ft. by 30 ft. being available, and hence assistance had often to be asked to run young stock, which otherwise lacked that exhibition bloom almost unattainable without a good grass run. Indeed, it was not until, in 1872, Mr. Wright removed to London, and at his Crouch End residence rejoiced in a good garden and a run of about an acre, that he was able to fairly do justice to his dark Brahmas. That year saw the cockerel, Favourite No. 3, win first and cup at both Palace and Birmingham, to be claimed at the latter show by Mr. Manby for the substantial sum of £30. Though never a frequent exhibitor, confining his entries generally to the Palace, Birmingham, Bristol, and Bath and West of England Society's shows, the rage for high-class Brahmas was then so strong that for some seasons Mr. Wright found his sittings of eggs booked for weeks ahead at

2s. 6d. per egg, and cockerels of his strain fetched from £5 to £6 each, and all this without a line of advertisement on his part.

Editions of "The Book of Poultry"

February, 1872, saw the publication of his first shilling monthly part of "The Book of Poultry," a work which at once scored a tremendous success; for, in addition to its clear and practical information, the masterly style in which this was expressed justly earned for its author the foremost position amongst poultry *littérateurs*. The fifty coloured plates, by Mr. Ludlow, with which the book was illustrated, were also a distinct advance in the delineation of the fancy points of poultry, and may be said to have initiated the style of bird portraiture so familiar to the readers of the modern Fancy Press. Some idea of the demand for Mr. Wright's great work may be gathered from the following facts. In 1876 a re-issue of the work was called for in fifty monthly parts; in 1883 a cheap popular edition was published without the coloured plates; the year 1887 saw a complete revision of the text and plates, owing to the changes which had taken place since the first issue; and in February, 1892, further revision was made in the text of the popular edition, then again re-issued. Such facts as these speak for themselves as to the estimation in which "The Book of Poultry" was held by English-speaking fanciers, and it is gratifying to know that foreigners also have, by translations, freely availed themselves of the store of knowledge with which the work is replete.


LEWIS WRIGHT.

It was but natural that pigeon fanciers should, on seeing what had been done for poultry, demand a similar work for their particular hobby, and so in 1874 was commenced "The Book of Pigeons," by Mr. R. Fulton, which owes no small measure of its immense popularity to the wise editorship and literary skill which Mr. Wright brought to bear upon the written notes, supplemented by many verbal conferences, recording Mr. Fulton's long experience of pigeons. This work, like its predecessor, has long ranked as the standard authority on the subject. From the experience gathered upon this work doubtless resulted "The Practical Pigeon-Keeper," uniform with its author's first book, which ran through eleven editions.

The editing of Blakston's "Canaries and Cage-birds," the first part of which appeared in 1877, may be said to have completed for a time the tale of obligation under which fanciers must always remain to Mr. Wright, and the list of books produced speaks well of his capacity for work, especially when it is remembered that during their production, from 1874 to 1879, Lewis Wright was editor of *The Fanciers' Gazette*, started by Messrs. Cassell, and subsequently developed by them into *The Live Stock Journal*. His tenure of this office was not always a bed of roses; for whether it was that the Fancy was then in the first flush of vigorous youth, and, so to speak, pugnaciously inclined, or from the fact that there were many abuses to be reformed—and to these the editor showed but scant mercy—the period was one when an honest expression of editorial opinion was often the signal for a fierce journalistic combat.

This literary activity, unfortunately, left but little time for attending to his own Brahmas, and after several disappointing experiences of poultrymen the stock was gradually reduced, and towards the end of the 'seventies the remainder disposed of to Mr. C. E. Perry, Wollaston, Mass., U.S.A. It is needless to say, to any of those who read "The Extinction of the Brahma," in 1893, that Mr. Wright thought the tendency for breeding to extremes, in fancy points, a dangerous one, and though always a staunch upholder of the *fancier* against those opponents who say that that individual has done nothing for poultry generally, yet deplored the fact that of late years less and less attention had been paid to the maintenance of the useful qualities of many of the varieties originally pre-eminent in this respect.

"The New Book of Poultry"

In October, 1900, was issued the first part of "The New Book of Poultry," a work which entailed the complete rewriting of the older book, so great had been the changes and developments in fancy poultry since its first publication. To this, Mr. Wright brought that same wonderful command of detail and ability to press home salient points which, together with systematic and scientific arrangement, had placed his former treatise ahead of any contemporary work on the subject. In April, 1902, despite business discouragements that would have broken the heart of many a man, Lewis Wright was able to write "*finis*" to a book that will live long in the memory of fanciers, and especially to the many who, like the writer, were concerned in its production. During this period Mr. Lewis Wright edited *The Poultry Club Standards*, and contributed the article on Poultry to "The Encyclopædia Britannica."

Presentation from Fanciers

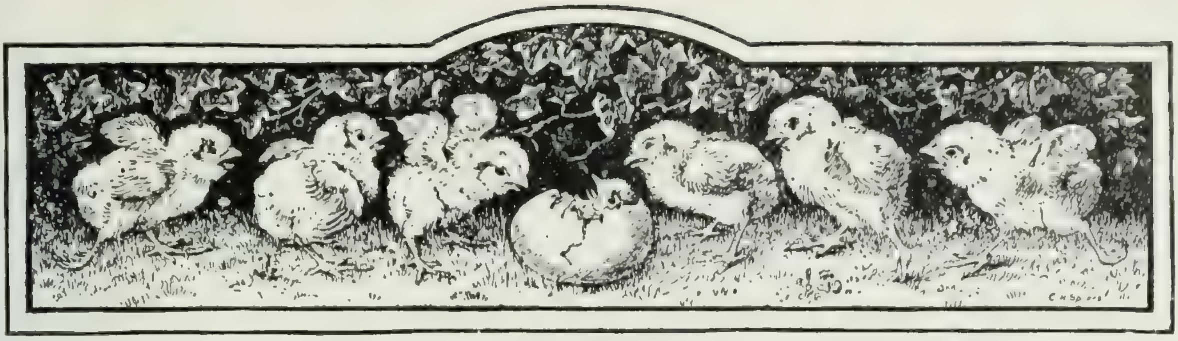
As a recognition of his services to the Poultry Fancy, at the International Show in December, 1901, the unique compliment was paid Mr. Wright of a presentation and dinner in his honour. No better summing up of Mr. Wright's work can be given than the following extract from the illuminated address presented on this occasion. It states: "You introduced a new spirit into the poultry world, and lifted the entire pursuit on to a higher plane than it had occupied before. Others have continued the work you began, but yours were the hand and brain which opened a new era in poultry journalism. Your constant advocacy of true principles in breeding, your earnest support of pure breeds when first introduced, and your fearless exposure of fraud, wherever found, have done much to strengthen and purify the exhibition world and to make the path of the wrong-doer more difficult. For this we owe a debt which can never be adequately acknowledged."

Other Activities

During 1900, whilst closing his connection with Cassell and Co., prior to his return to Bristol to take up editorial work with his brother's firm, Messrs. John Wright and Co., Mr. Lewis Wright assisted my wife in the editorial work of *The Feathered World*. In Bristol, his work was largely connected with the supervision of the many medical books published by his brothers. In 1904 was commenced a slight revision of "The New Book of Poultry," which was completed shortly before Mr. Wright's death.

It was in 1877 that as a boy fresh from school, entering the great publishing house of Cassell, I first met Lewis Wright, and after that we were constantly associated in our work. I have dwelt necessarily in this note upon the side of his life work that relates chiefly to the subject of this book; but in other circles Lewis Wright was equally well known. He was a member of the London Physical Society, known amongst scientists as the author of "Light" and "Optical Projection," as well as for his mica preparations illustrating polarised light, and also as the inventor of the projection microscope now in use at most of our scientific institutions. He was also a contributor to theological literature, his most important work, *The Cross of Our Lord*, being left in MS. at the time of his death and since published by Messrs. Nisbet.

Such is the bare outline of the busy, strenuous life—suddenly cut short in December, 1905, by accident when crossing the line at Saltford Station to catch a train—led by one who, whilst passing generally as an extremely reserved man, hid under that exterior a fund of dry humour and kindliness, and, above all, a high fixity of moral purpose, which helped to the accomplishment of splendid work under conditions of health and other anxieties that would have crushed a weaker temperament.



MENDELISM AND ITS APPLICATION TO POULTRY BREEDING

By the Rev. E. Lewis Jones, M.A.

WITH the twentieth century a new science has sprung up, under the title of Genetics, which concerns itself with the study of the physiological problems of variation and heredity. It is proposed to show in this chapter how Genetics bears upon the work of the poultry fancier and breeder generally. The attempt is of an elementary nature, as only the rudiments of the science will be treated. Those who desire to pursue the subject farther are advised to consult the list of books at the end of the chapter.

Genetics

Poultry have been found useful to experiment with, as a number can be raised from the same parents in one year. These will breed within the year, and so in a comparatively short time the results will be observed on a number of generations. Flowers, mice, canaries, etc., have also been, for the same reason, found useful subjects for experiment.

Variation and heredity are familiar problems to the poultry fancier, for he is essentially a breeder. His success depends upon the ability with which he mates his stock to produce the desired results. To him the questions of heredity are vital questions, as the success of his labours depends largely upon his knowledge —empirical or scientific—of the laws of heredity. In the course of his work, the breeder meets with many experiences and various problems and riddles, which he would much like to understand. His experience makes him familiar with the many and varied facts of heredity, and so far science has done but little to assist him to an understanding of the numerous complex problems he meets with.

Are these problems insoluble? Will the laws of heredity ever be sufficiently understood to enable these riddles to be read? And further, will the laws of heredity be so well known that the breeder can confidently set about his work with the knowledge that he can surely get certain desired results? So far he is rather sceptical as to there being any possible solution of his difficulty. Be that as it may, those who have observed the progress of Genetics during the last few years assert that even if it does not solve all difficulties, it will at any rate solve a great number of them. Genetics will enable us to go definitely to a certain end, will save a number of useless experiments and will prevent waste of material and time. This will be especially noticeable in the manufacture of new breeds.

The observant breeder is aware of two facts which are met with in the course of breeding: (1) the transmission of a certain likeness; (2) the difference in the individuals which are the product of any given pair of parents. The progeny superficially resemble the pair in all respects, so much so that a casual observer would say they were all alike and would classify parents and progeny as belonging to a certain breed or variety. This superficial resemblance has led to the well-known statement "like produces like." The breeder knows only too well the limitations of that statement. A close examination would reveal the fact that these individuals differ in marked respects amongst themselves, as well as from their parents. This apparent similarity which exists together with real differences, is probably intimately connected with the solution of the problems of heredity.

The methods of breeders have so far been only empirical, and were so, of necessity, owing to the fact that science had not helped with definite knowledge. To be helpful, science must not only be explanatory, but must enable the breeder to predict the results of certain matings, just as the chemist predicts the result of placing two substances together. Genetics may not for some time reduce the science of breeding to the exactness of chemistry ; possibly with living organisms the exactness of physical science is unattainable ; still Genetics will throw a great deal of light upon the work of breeding and will point the way to a high degree of exactitude.

What is Mendelism?

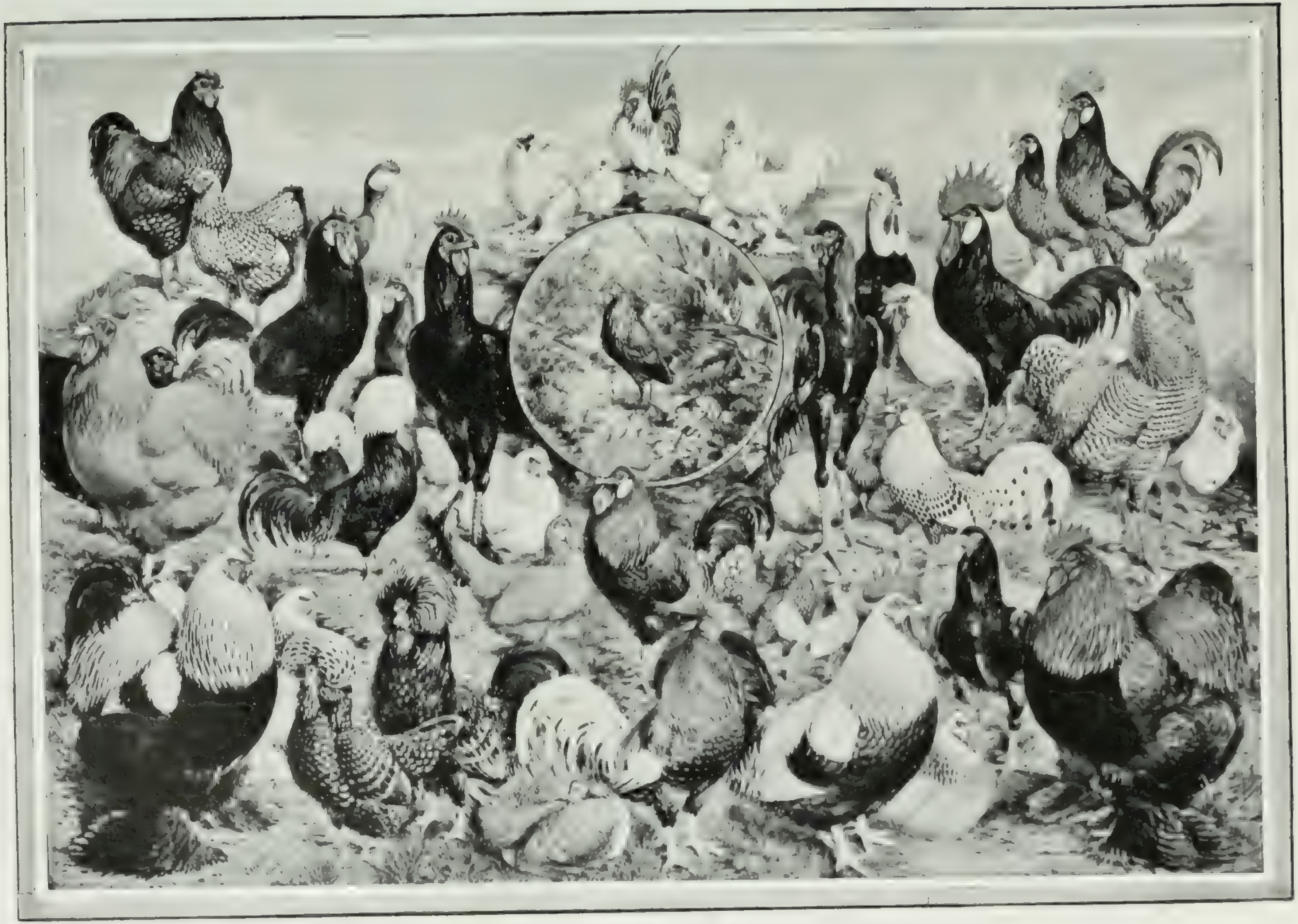
Mendelism is the name applied to the methods which Gregor Mendel used in his experiments on heredity and variation. These methods have been revived during the last ten years by the pioneers of Genetics. Mendel's manner of experimenting affords a practical means of tackling the problems of heredity, for it enables us to trace the history of any character or characters through one or more generations. So far Mendelian experiments have been concerned with cross-breeding. At first we may be inclined to doubt how far the results so established will help the breeder of pure stock. But cross-breeding has been resorted to because it was easier to perceive the course of heredity by crossing specimens with characteristics markedly different, such as tall or short peas, rose or single comb in fowls, etc. The knowledge of heredity so gained will prove of value to the breeder of pure stock in many ways, for it will inform him of the methods used, and will put at his disposal means of testing the breeding value of his stock, and will also open up ways of strengthening and perfecting his pure bred animals and birds. A caution must, however, be entered here as to the possibilities of Mendelism for the fancier, at any rate for the present. Professor Bateson says, " applied to the business of breeding winners in established breeds the principles of Mendelism cannot materially help, for almost always the points which tell are too fine to be dealt with in our analysis. The principles already ascertained will be found of practical assistance in the formation of new breeds, and may save many mistakes and waste of time. Indirectly, however, as Mendelian methods familiarise the processes of heredity, so far they will assist the breeder in his work."

There are certain lessons taught by the facts already learned from Mendelism which are of great use to the breeder and which he should apply in his own work. First of all, the value of breeding from known individuals has been thoroughly established. To succeed on Mendelian lines the breeding must be done with individuals. It is not possible to establish any facts by breeding indiscriminately from a pen of birds. Trap nesting had undoubtedly in the past brought this home to the average breeder, but not with the same force as Genetics has. The fact that trap nests have been in more or less general use is evidence that the fancy as a whole was learning from other sources this lesson of breeding from individuals. This practice, established first, probably, for utilitarian purposes, has been justified by Mendelian experiments, which have shown that the trap nest is as valuable to the fancier as to the utility man. Many a fancier can point to individual birds as the sire or dam of their noted winners. Mendelism, then, teaches the breeder that he must breed from individuals, and that he ought to know the progeny of every one of his stock birds. With this knowledge he will be able to discard the wasters, and to mate up for next year's breeding, with an accuracy approaching almost to mathematical exactness.

Breeding Value

The breeding value of a bird does not depend so much upon outward appearances as upon pedigree in the Mendelian sense. The idea of pedigree generally accepted is that of stock, being bred in one way for a number of generations. Mendelism teaches us to look upon pedigree in the light of the nature of the factors contained in the germ-cells of the individual birds. If those factors are the ones required, then the pedigree is satisfactory ; if those factors consist of any not required, if there are too few, or some which inhibit the action of the rest, then the pedigree is not satisfactory. Mendelism has shown that a satisfactory condition is independent of the number of generations for which the strain has been bred ; it is possible to attain it in the second. The points upon which the excellence of a show bird depends are often, as will be shown later on, probably " fluctuations " (*i.e.* non-transmissible variations), and for these reasons a very perfect exhibition specimen may not be a first-class breeder. An ordinary specimen of the same strain will probably do quite as well in the breeding pen, and so the fancier would be well advised to buy the ordinary bird at a moderate sum rather than the prize-winner at a long price. Mendelism thus enables a breeder to place a correct value on pedigree.

In mating up pens the general advice given is that no two birds which have the same faults should be mated together, but that when one has a prominent fault the mate should be strong on that point. This general advice is undoubtedly good and sound, and Mendelism explains how and why it works, and further it shows us how to utilise birds in future breeding



THE JUNGLE FOWL AND SOME OF ITS DESCENDANTS.

(Reproduced from the large coloured plate published by "The Feathered World.")

operations when the parental faults appear in them. It enables the breeder to appraise the breeding value of a bird in a more intelligent way than he ever did before. It furnishes an intelligent explanation of many empirical methods which have been followed and enables breeders considerably to extend these methods. In breeding rose-comb birds, specimens very often appear that are first class in all respects except the comb, which is single. So far breeders have not hesitated to use such birds for breeding. Mendelism explains such an appearance and also shows us how pure rose-comb birds can be bred from such a one. This will appear later on when rose and single combs have been dealt with as Mendelian characters.

Test

Mendelism suggests that every breeder should test and analyse the birds from which he breeds. The birds are, in fact, to the breeder what the test-tubes are to the chemist. By applying the principles of Mendelism to his stock the breeder will have a knowledge of his birds that he never dreamt of before. He will be able to know their strong points and their weak points as breeders. Crossing during the off season or in their first year will quickly enable him to detect the weakness and the strength of his birds. With this knowledge he will know how to perfect their strong points and how to guard against the weak.

Most breeders have found that a certain two birds do not mate well together. Mendelism suggests that both should be analysed and the reasons for this failure discovered. Having done this, the breeder will be able, from a similar knowledge of his other birds, to know the right birds to mate together. In this way pedigree will be a real and valuable asset to every breeder.

Life Cycle

In the lowest organisms the race is propagated by the organism growing and dividing into two exactly similar parts, each part being an exact reproduction of the parent; after division it is impossible to say which is the parent and which is the offspring. This mode of reproduction is confined to organisms made up of one cell. As we ascend in the scale of life, organisms are no longer made up of one cell, but of many, and these cells are differentiated in functions. Some are set apart to form bone and organs of locomotion, others form organs of digestion, and others organs of reproduction, etc. In the unicellular organism all these functions, locomotion, digestion, reproduction, etc., are carried out in the one cell. But no matter how complex the animal may be in its initial stage, every organism springs from one cell, which is called the *zygote*. This zygote has been formed by the union of two germ cells (gametes) derived from a male and a female parent. The male germ cell (gamete) is called spermatozoon; the female germ cell (gamete) is called the ovum. To repeat, the zygote is the single cell which will by repeated divisions form the new individual, and it itself has been formed by the fusion, or blending, into one cell of the male and female gametes. This individual in time reaches the adult stage and itself forms gametes, and so is equal to taking its part in the reproduction of its own species, and thus the life cycle is complete from gamete to gamete. In the case of the fowl the union between the male and female gametes takes place in the upper portion of the oviduct. The zygote so formed is contained in the fertile egg and by incubation gives rise to the chick which grows into the adult fowl.

What is Heredity?

Heredity has been defined as the tendency which all living beings exhibit to assume the structures and to perform the functions characteristic of the species to which the individual belongs, and to transmit the same to their offspring. We have just briefly touched upon the process by which this transmission is brought about, and from a consideration of it, it is clear that whatever the new organism receives from each parent must be received through the gametes. The problem of heredity resolves itself into the elucidation of the laws which govern the transmission of the parental characteristics to the offspring, through the medium of the gametes. At the outset a natural question arises as to whether this process occurs in a definite and regular way or in an indefinite and irregular way. If the transmission of characteristics occurs in an irregular way it follows that we can never hope to gain a full insight into the scheme as a whole, but can only follow it in the particular cases we may examine. The examination of such particular cases will not help the breeder much if the results vary with each individual mating, if not with each individual impregnation. Unless there is a regularity about the process which extends to all cases, unless it follows definite lines, the study of heredity, interesting as it may be in particular cases, will not be of much use to the breeder generally, and he will still have to continue on empirical lines (which have certainly produced excellent results in the past) and he will leave severely alone a study which cannot practically assist him.

Mendelism points to the fact that the transmission of parental qualities is effected in a definite and regular way, and that being so it is a matter for investigation with a tolerable certainty that the secret, so far well guarded, may be learnt and the Gordian knot of heredity may be unravelled. The first step to this solution is the fact that parental characters are transmitted to the offspring as units, and this transference by "units" gives an intelligent explanation of the regularity that has been observed in cases that have been studied. The unit character may be for some reason latent in one generation, but may be transferred to the next without the influence which inhibited its appearance in the parents; then it will reappear. Thus the grandchild may show some character of a paternal or a maternal grandparent which was not apparent in the intermediate generation. Other characters require to be received from both parents before they appear and so are latent until this condition is fulfilled. The students of Genetics must grasp the fact that the separate characters are transmitted (or not transmitted) as unit characters. If the characters were not transmitted as units but as indefinite fractions, then it would be impossible to predict any result, as the character would vary in intensity according to the value of the fractional part transmitted.

An individual bird should thus be regarded as an aggregation of characters. These characters have been derived from two parents: the dual nature of every individual must be comprehended before the principles of Mendelism can be understood and applied in the process of practical breeding. When the individual has received a similar set of characters from each parent, it is said to be pure bred; when it has received a set of characters from one parent differing from the set derived from the other parent, it is said to be impure or cross bred, even though the differing characters may not be apparent in the first generation, but remain latent. For instance, cross a pure rose-comb with a single-comb bird: all the offspring are rose-comb but the rose is an impure rose and the bird is a cross-bred in respect to comb. It is only pure when it receives the elements of roseness from each parent. The impurity will show itself when these birds are inbred. We thus get a definite meaning attached to pure bred and cross-bred, a meaning which will bear the test of breeding.

Fanciers have in reality always regarded a bird as an aggregation of characters. In breeding a winner, the fancier has kept his eye on the bird from beak to tail and from comb to toes, and in judging it the bird has been examined and weighed according to its excellence in all the characters visible to the eye. The standards of excellence for the various breeds award points for these outward characters. Mendelism introduces the breeder to methods with which he is familiar and which he has pursued in the course of his labours. The principles of Mendelism justify the methods he has employed, and will enable him in future to place them on a sound scientific basis.

It is clear, then, that the individual is what he is from the contributions he has received from both parents, and thus it is true that all individuals (not poets alone) are "born, not made." These contributions have been made through each gamete or germ cell, the one supplied by the male, the other by the female. The question can be legitimately asked, how much of this machinery of the gamete is understood, and how far can it be explained? In the present state of Genetics the answer is that very little is known of the actual machinery for the transference of characters, i.e., of the internal arrangement of the gamete. Prof. Bateson has stated, in reference to the probable constitution of the factors which make up the gamete, that "several of them behave much as if they were ferments, and others as if they constructed the substances on which ferments act."

Segregation

To understand the way in which the methods of transference take place, it is necessary to follow what happens in regard to those characters which compose the individual when it comes to reproduce its own species. The dual nature of the individual must be borne in mind, viz., that its characters have been derived from two sources. It has been discovered that, in the formation of the germ cells, the characters from each parent are re-sorted and this re-sortment of the parental characters, during the formation of the gametes in the individual, is the central fact in Mendelism and it is termed "Segregation." We shall see later on how this fact explains the phenomena observed, and how owing to it the parental characters are transferred (or not transferred) by the offspring to the next generation in a definite and regular manner. In this re-sortment (segregation) each character behaves as a unit and is present as a whole in the gamete formed or totally absent from it. If the characters are opposite in nature, as rose and single comb, only one of them can be present in the gamete. Such characters are said to be *allelomorphic*, i.e., one or the other only can be present in any gamete. Thus the gamete of an impure or cross-bred bird will be pure for the character it contains, and the cross-bred individual gives rise to two different kinds of gametes, e.g., an impure rose-comb bird forms gametes, some of which contain roseness only, some the factor for single comb only. In no gamete will the character for both rose and single comb be found. This explains why two birds both impure rose-combs will breed pure rose-comb and pure single combs.

To the Mendelist a bird is composed of a great number of allelomorphs, and so far the action of a few only are known. The practical use of Mendelism to the fancier is confined to those allelomorphic characters which have been completely investigated. Many experimenters are at work, and as time goes on the investigation of more and more of these allelomorphic characters will be completed.

Mendel

Gregor Johann Mendel was born on July 22nd, 1822, at Heinzendorf bei Odrau, in Austrian Silesia. He was given a good education in his youth and entered the monastery of Brünn in 1843. He was ordained priest in 1847. From 1851 to 1853 he studied at Vienna, and in the latter year he returned to Brünn and took up teaching in the Realschule there. He relinquished this work in 1868 on his appointment as abbot. His classic experiments on the edible pea (*Pisum sativum*) were carried out in the cloister garden, and the results were published in the Proceedings of the Natural History Society of Brünn under the title of "Experiments in Plant Hybridisation." He died January 6th, 1884. It does not appear that his work was known to naturalists, though he at one time explained it to the botanist Carl Nägeli, and it was not until the rediscovery of his paper in 1900 that the real value of his contributions published in 1865 was understood. The rewards of scientific workers are not always commensurate with their labours; some receive immediate recognition, whilst others, like Mendel, have to wait some decades before the true value of their work is known. Let us hope that the pursuit of knowledge is in itself a sufficient reward to them for their efforts.

Mendel's experiments show him to have been a remarkable genius. This is proved by the discrimination he displayed in selecting the right material to work with and the right characters to observe; by the absolute accuracy of his results (as borne out by others who have lately repeated his experiments); by the minute and clear record he kept; and, above all, by his insight into the true meaning of the facts he observed.

His Experiments

He crossed two peas which differed in height, one being about 6ft. and the other about 1ft. The seeds produced by this cross-fertilisation were sown and all grew into tall plants. This tall generation from the cross-bred seeds is called F_1 (first filial generation). As all these plants were tall, Mendel called the character which prevailed the *dominant* character, and the character which was unable to appear the *recessive*.

F_1 generation was self-fertilised and its seeds sown; the plants this time grew up, not all tall as F_1, but tall and dwarf in the proportion of 3 to 1. This generation is called F_2 (second filial generation). On being self-fertilised, the plants of F_2 were seen to be of three kinds:—

(*a*) Pure Dominants. Tall plants which gave talls only for the next and succeeding generations.

(*b*) Impure Dominants. Tall plants which gave talls and dwarfs in the same proportion as F_1.

(*c*) Pure Recessives. Dwarf plants which gave dwarfs only in the next and succeeding generations.

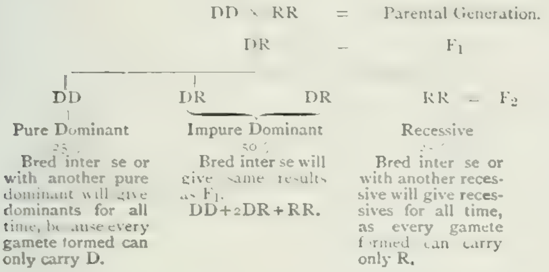
On testing the talls of F_2 generation it was found that the proportion of the pure talls (*a*) to impure talls (*b*) was 1 to 2. Thus pure talls and pure recessives were equal in proportion and together formed half the produce.

Expressed as under, the result can be clearly understood:—

25	50	25
Pure Dominant	Impure Dominant	Recessive

Tallness and dwarfness are allelomorphs, unit characters, transmitted as a whole from parent to progeny. Thus regarding them, it is easy to explain the above results. F_1 generation was produced by the union of male and female gametes, each one bearing either the dominant or the recessive character, and so the zygote formed by their union was impure in that it contained both elements. When F_1 came to form gametes, then segregation occurred. The characters (united in the zygote) separated or segregated and each gamete carried one, only one, and one as a whole of the characters, either the dominant (tall) or the recessive (dwarf). When fertilisation took place a gamete carrying the dominant character could unite with one also carrying the dominant character and so form a pure dominant, DD, or it could unite with one carrying a recessive character and so form an impure dominant (DR). Likewise a gamete carrying a recessive character could unite with one carrying a dominant character and so form an impure dominant (DR), or with one carrying a recessive character and so form a pure recessive (RR). This exhausts all possible combinations

$(D+R)(D+R)=DD+2DR+RR$. A consideration of this will lead to the same conclusion that has already been arrived at practically, viz., that the result would give 25% pure dominants, 50% impure dominants, and 25% pure recessives. These results are usually represented diagrammatically thus—D standing for the dominant and R for the recessive character :—



Bred inter se or with another pure dominant will give dominants for all time, because every gamete formed can only carry D.

Bred inter se will give same results as F_1. $DD+2DR+RR$.

Bred inter se or with another recessive will give recessives for all time, as every gamete formed can carry only R.

If the impure dominants are bred with a dominant, they give 50% pure dominants and 50% impure dominants $(D+D)(D+R)=2DD+2DR$; bred with a recessive, they give 50% pure recessives and 50% impure dominants $(R+R)(D+R)=2RR+2DR$.

When the zygote formed by the union of the male and female gametes has received the same elements from each gamete, e.g. either the dominant or the recessive character from both, it is said to be homozygous, or a zygote pure for that character; when, on the other hand, it receives one character from one gamete and the other character from the other gamete, it is termed heterozygous, or a zygote impure for that character.

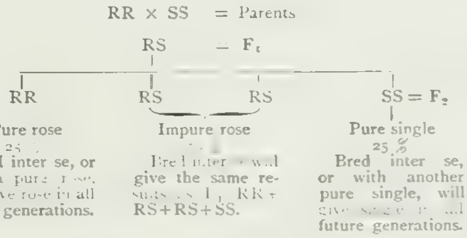
In Mendel's experiment given above, each parent is pure, F_1 is heterozygous. In F_2, 50% are homozygous (i.e., 25% homozygous for tallness and 25% homozygous for dwarfness) and 50% are heterozygous, impure zygotes containing both characters.

This experiment of Mendel's which we have just considered, illustrates clearly his method, which is essentially simple. It is applicable to all allelomorphic characters in every species of animals and plants. Mendel himself investigated, in peas alone, seven distinct allelomorphs (pairs of characters).

Mendelism and Poultry

The pioneers in the re-establishment of the methods of Mendel are De Vries, Correns, Tschermak, and in England, Bateson. The work has been carried on with plants and animals. As breeders of poultry, we are here only concerned with the work that has been accomplished in our own domain. Results will be given briefly, as a full discussion of each case would carry us beyond the limits of this chapter. What is given will be found sufficiently suggestive for those who may wish to repeat the experiments, or to devise others of their own, in which they can follow the course of heredity in one or more selected characters. Fanciers are as a rule very keen on experimental matings; a great deal of work of this kind has been done, and undoubtedly much useful knowledge has been lost because the results of these matings have not been put on record. The field of investigation is a vast one; the scheme of coloration alone covers a wide area, and it will probably be some time before it is fully explored. Little has been achieved as yet, but sufficient has been done to show that Mendelism offers a method by which the problems can be solved. Every result established assists the breeder in his labours, and he can proceed with certain knowledge as far as an investigated character is concerned.

The simplest illustration of the application of the principles of Mendelism to the breeding of poultry is seen by crossing a rose-comb with a single-comb bird. It is a matter of common knowledge that the result of such a mating is rose-comb progeny, and Mendelism enables us to explain these facts. Rose is evidently dominant over single, just as tallness was dominant over dwarfness. If the experiment is continued and the rose-comb F_1 generation is bred inter se, we get 75% rose to 25% single, and of these 75% rose one-third or 25% of the whole are pure rose. In fact we get exactly the same behaviour as in the case of tall and dwarf peas, only roseness takes the place of tallness, and single the place of dwarfness. The result can be expressed diagrammatically, R = rose and S = single.



Bred inter se, or with a pure rose, will give rose in all future generations.

Bred inter se will give the same results as F_1, $RR+RS+RS+SS$.

Bred inter se, or with another pure single, will give single in all future generations.

The type of rose-comb in F_1 varies considerably, some being almost as perfect as the parental type, whilst others fall away considerably from this standard of perfection. It is not possible to distinguish the pure rose from the impure by observation, the only real test is breeding, and it does not follow that purity coincides with perfection of comb. To test which are the impure roses in F_1 each individual must be mated to a single-comb bird; the pure rose bird will give a progeny all rose-comb. The reason is obvious when the pure dominant is mated to the recessive, the resulting progeny all resemble the dominant, in this case all are rose-combed, thus :—

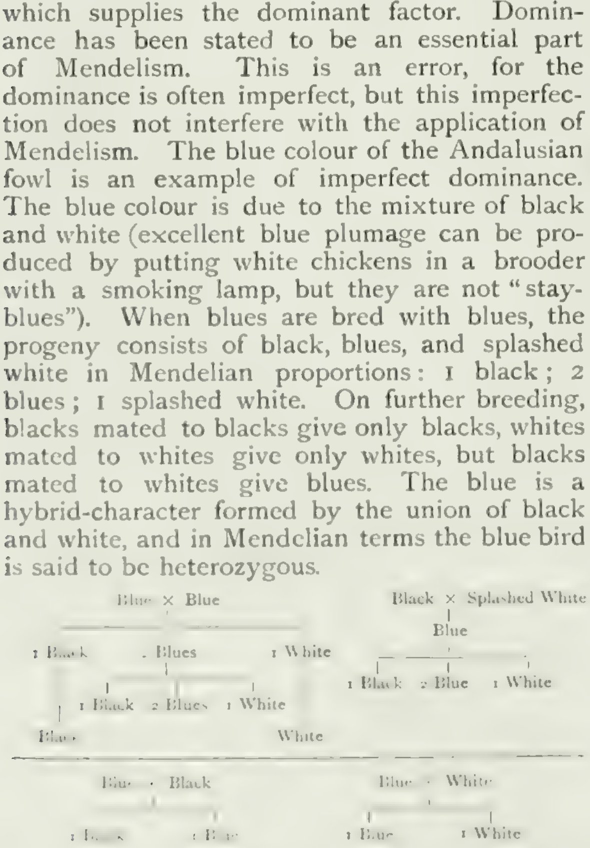
RR × SS
RS

the impure mated to the recessive will give half rose and half single, thus :—

RS × SS
RS SS

From this we gather how to test for the purity of any one character in a bird. Mate the doubtful bird to a bird known to be pure recessive in that character, the progeny will decide the question, all being pure if both are pure, some recessives appearing if the bird under analysis is impure.

The two cases (pea and rose-comb) investigated are examples of nearly perfect dominance where the F_1 generation resembles the parent which supplies the dominant factor. Dominance has been stated to be an essential part of Mendelism. This is an error, for the dominance is often imperfect, but this imperfection does not interfere with the application of Mendelism. The blue colour of the Andalusian fowl is an example of imperfect dominance. The blue colour is due to the mixture of black and white (excellent blue plumage can be produced by putting white chickens in a brooder with a smoking lamp, but they are not "stay-blues"). When blues are bred with blues, the progeny consists of black, blues, and splashed white in Mendelian proportions: 1 black; 2 blues; 1 splashed white. On further breeding, blacks mated to blacks give only blacks, whites mated to whites give only whites, but blacks mated to whites give blues. The blue is a hybrid-character formed by the union of black and white, and in Mendelian terms the blue bird is said to be heterozygous.



In the above case the hybrid-character is easily distinguishable from either the dominant or recessive, whilst in the two preceding cases it could only be distinguished by the test of breeding.

Dominance

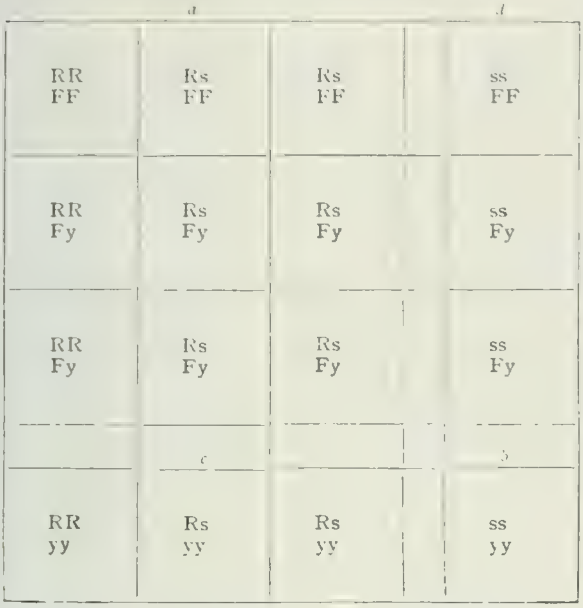
What is meant by this term? Dominance is the name given to an observed fact that one character, owing to the "presence" of some factor, appears in the individual to the exclusion of another character (recessive) which is unable to appear.

Numbers

The numerical proportions given throughout this chapter hold good only when large numbers are bred. With small numbers chances are against their being found to be absolutely true, but when sufficient numbers are taken the actual results approximate closely to the theoretical. So far we have only considered one allelomorphic pair at a time, and we have found the proportion to be 3D : 1R. If two allelomorphic pairs are considered, the result is more complicated and the possible combinations are considerably extended, as each pair is transmitted independently of the other. The following experiment will illustrate what is meant. A Campine cock was crossed with a Silkie hen and from the many allelomorphic pairs in the birds we will select for this illustration comb and feathers, though any two could have been selected without prejudice to the argument. The Campine has single comb and feathers, the Silkie a rose-comb and silk. The F_1 birds were all rose-comb and feathered, single comb and silk being recessive. Let R=rose-comb, s=single, F=feathers and y=silk. Then the Campine cockerel will be Fs and the Silkie hen will be Ry: the zygotic combinations of F_1 birds will be RsFy. Taken independently, any allelomorphic pair gives rise to four possible zygotic combinations in F_2. In F_2 the four zygotic combinations of the first allelomorphic pair, Rs, will be RR, Rs, Rs, ss; likewise those of the second pair, Fy, will be FF, Fy, Fy, yy. It is clear since the pairs of allelomorphs are separately transmitted that the first of the four zygotic combinations of the first allelomorphic pair RR can appear with every one of the four zygotic combinations of the second pair, FF, Fy, Fy, yy and will give rise to four combinations RRFF, RRFy, RRFy, RRyy. Similarly the remaining three combinations of the first pair (Rs, Rs, and ss) can also each combine with each of the combinations of the second pair. There are thus sixteen possible combinations :—

$$(RR+Rs+Rs+ss)(FF+Fy+Fy+yy)$$

These results are made evident by such a diagram as the following, in which the four zygotic combinations of the first pair are written four times horizontally, and the four combinations of the second pair are written four times vertically.



RR FF	Rs FF	Rs FF	ss FF
RR Fy	Rs Fy	Rs Fy	ss Fy
RR Fy	Rs Fy	Rs Fy	ss Fy
RR yy	Rs yy	Rs yy	ss yy

An examination of the above diagram shows that in nine cases (Fig. *a*) the dominants rose and feathers appear together; in three cases (Fig. *c*) rose and silk are found together, in another three cases (Fig. *d*) feathers and single are found, while one bird in 16 (Fig. *b*) has single comb and silk. This last forms a new variety, the gametes formed being pure for single comb and for silk. Out of these 16 combinations there are 4 visible types arranged in the following arithmetical proportions :—

9 : 3 : 3 : 1

A consideration of the above will show what has already been emphasised, that outward appearances are no real criterion of the breeding value of any bird. Only the first RR FF and the last ss yy are zygotes pure in both pairs of characters.

When three allelomorphic pairs are observed together, a similar reasoning, or a mathematical formula, will show that there are sixty-four possible combinations, though in outward appearances there would be only eight types.

To return to the well-known mating of rose and single comb, in F_1 there were only two types rose and single, but four combinations (one pure rose, two impure rose, and one single). When two allelomorphic pairs are considered, the number of types, as we have seen, is 2^2 and the number of possible combinations is 4^2. When three pairs are taken together, the number of types is 2^3 and of combinations is 4^3. With "n" allelomorphic pairs the number of types visible is 2^n and of possible combinations 4^n. Complete dominance is assumed here.

Characteristics of a fowl

According to Prof. Bateson, a fowl may be regarded as a "basal organisation" upon which, through the agency of certain factors, a number of characteristics have been built up or superimposed. What essentially is the "basal organisation" we cannot tell. At present we know very little of the action, or nature, of the factors which induce the changes which produce varieties. When we do, we shall have a clearer knowledge of the origin of species than we now possess. In the variations observed among birds we can distinguish two kinds :—(*a*) Fluctuations, or non-transmissible varieties; appearances which seem to be the peculiar property of one individual. Probably most of the scoring points of a show bird come under this head. (*b*) Mutations or transmissible variations; changes which appear in response to certain factors which form part of the individual and are handed on to its progeny.

Comb.—We have seen that rose is dominant over single, i.e., that it is a single + some factor which causes it to appear as rose. Most forms of comb are dominant to single. Many experiments have been and are being made, but as long as we cannot satisfactorily explain the appearances of side sprigs, etc., Genetics has not completely read the riddle of the comb.

Size.—It is still a matter of doubt whether size is an allelomorphic character.

Fifth toe.—This appears to be dominant; dominance is somewhat irregular, as it may appear on one foot only, and there are cases known of four-toed recessives transmitting it to their progeny.

Feathers on legs.—This is dominant but its transmission may be governed by two factors, which would explain its appearance in the progeny of two-cleaned birds of different strains mated together.

Crest and Muff.—Incomplete dominants, the characters always appear but vary in size.

Broodiness.—Dominant, the progeny always show a tendency to sit, but are somewhat uncertain and erratic and leave the chicks earlier.

Colour of egg.—Brown is an incomplete dominant, shade varying.

Size of egg.—An incomplete dominant.

Prolificacy.—It is doubtful whether it is a dominant in any proper sense, but cross-bred birds between light and heavy breeds are always better layers than the heavy breeds.

Type.—This is not a unit quality, as it depends upon (*a*) the shape of the body and (*b*) the nature and distribution of the feathers.

Colour.—Very little is known; dominance depends upon the breed rather than upon the colour; the white of the Leghorn is dominant, whilst that of the Silkie is recessive. Blue is heterozygous in Andalusians and probably so in the newer breeds. In certain blue varieties of game it is said to be homozygous.

Red ear-lobe.—Imperfect dominant.

Eye colour.—Black is dominant.

As the light thrown by Mendelism on the problems of Heredity grows greater, fanciers will be obliged to modify their views on certain points (this we have already seen in the case of purity and pedigree), and to express other phenomena in Mendelian terms; prepotency, for example, will have to be expressed in terms of dominance. Mendelism does not so much do away with the old ideas as give a working hypothesis which explains them, and puts on a scientific basis what before was more or less "rule of thumb."

Prepotency.—It was thought that a bird bred for many generations for certain qualities would be able to transmit them in a greater degree than other birds bred for a shorter time; but now it is known that dominance of the characteristic, and not a long pedigree, determines the "prepotency." Thus pedigree will be valued only by the nature of the gametes formed.

Reversion.—It is a common occurrence for breeders to find that one bird reproduces an original ancestral form. This happens when, through the addition or subtraction of a certain factor or factors, the elements are the same as those in the constitution of the original bird. This often happens when fresh blood is introduced from a different strain by means of which the complementary factors are brought together.

Sports

A variety may be line-bred for twenty years and in the twenty-first (certain new forms, not reversions to any ancestral forms) make their appearance; such new forms are termed "Sports." They are probably due to the subtraction of a positive factor or the omission of an inhibiting factor. In the first case a certain characteristic is omitted; in the second a new one, hitherto prevented from appearing, asserts itself.

Correlation or association of factors

Certain characteristics always seem to be associated together in the same bird, the one never being found without the other. Is the relationship real or accidental? Without strong evidence in support of the first alternative, it is difficult to believe that the independent submission to the laws of Heredity, which we found to be characteristic of the different allelomorphic pairs, does not hold good for all such pairs. The eminent leader of the Mendelian School in England is however of opinion that between certain factors this relationship is real.

Sex-limited inheritance

Reciprocal crosses do not give identical results. This is most clearly seen by crossing light and heavy breeds both ways. The offspring resembles the maternal side in size, broodiness, and egg-colour. Prof. Bateson and Mr. Punnett found a case of sex-limited descent, in the inheritance of pigment, in the reciprocal crosses between brown Leghorns and Silkies. This accounts for some of the anomalies met with in the course of breeding, e.g., the difficulty of obtaining good legged females in Wyandottes. No doubt certain sayings current in the fancy have a scientific foundation.

Incompatibility

It looks as if certain characters are never found in combination, e.g., prolificacy and excellence of table qualities; yellow shanks and absolute soundness of black plumage, etc. What the incompatibility is due to it is impossible at present to state.

There are very many interesting phenomena which we should like to be able to explain, such as Dimorphism, hen-feathered male birds, etc. If the idea that our domestic fowls are all descended from the *Gallus Bankiva* (single comb, white egg) is correct, it would be interesting to know at what time and by what means the factors for other combs were introduced; how and why tinted egg-shells appeared, etc. A full solution of all these problems may be too much to expect, but Mendelism supplies the methods by which the problems of Heredity and Variation can be solved.

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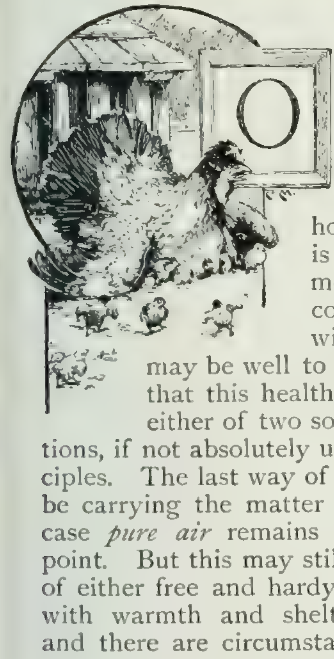
CHAPTER I.

POULTRY HOUSES AND RUNS.



OF all matters connected with poultry-keeping, the fowl-house is generally the first to be considered; and healthiness in the house and surroundings is certainly one of the most important of all considerations connected with the undertaking. It may be well to point out at the outset that this healthiness may be sought in either of two somewhat different directions, if not absolutely upon two different principles. The last way of putting it would indeed be carrying the matter too far, since in every case *pure air* remains the first and essential point. But this may still be sought in the way of either free and hardy exposure, or combined with warmth and shelter from the weather; and there are circumstances which may make either of these general methods advisable.

It is but comparatively recently that the possibilities and advantages of the open-air method have been generally recognised, though even in the first edition of this work impressive examples were given of Dorkings and Spanish becoming hardy and healthy under the Spartan regimen of an entirely out-door life. The results of this, when fully carried out, we see best in pheasants and other game birds, whose health, vigour, and extraordinary gloss and elasticity of feather far surpass that of house-kept birds. On the other hand these races, in confinement, are abnormally "delicate," and the mortality is great: they die off, just as aborigines do when missionary convention has put them into trousers and closed rooms. We, on the other hand, trained by long heredity, find the clothes and the closed rooms a necessity, and perish under "exposure."

Hardiness and Delicacy.

We thus learn that there are two entirely different kinds of "delicacy." One animal, or human being, may be supremely hardy towards any merely inclement conditions of open-air life, while delicate towards the least vitiation of air or pasturage. Another race or family, by its training, will be "delicate" to the exposure, but hardy towards the consequences of confinement and crowded life. These may appear truisms to many; but there are some who never seem to have given a thought to them, or to their real bearing upon questions of practical management and rearing; and so we have presumed authorities maintaining that the proper and only profitable way to rear turkeys, even in this country, is to give them unlimited range and free exposure, in the neighbourhood of woods especially, and regardless of poachers, foxes, wanderings, and such other drawbacks as encounter a proprietor in places where such methods are even possible. Those who have considered what we have above briefly recalled, will see that almost every such question of general management has two sides, and that in a country already civilised and crowded with inhabitants, there will generally predominate a necessity for adopting the conditions of civilisation.

Free Exposure System.

The limitations, and the advantages, and the methods of the exposure system of keeping poultry, may be shortly stated. It can only be carried out *altogether:* there must be the wide range, leading to active exercise and pure air, or it is fatal. Where, however, these can be had, breeds whose best "condition" is hard flesh and tight and glossy plumage, will attain that condition in a degree that can hardly be equalled in any other way; and there will be little illness. At the commencement, a few of the first stock (reared on another system) may probably perish, and the weakly ones of a given hatch may be quickly weeded out; but on the whole this system, fully carried out, produces health and condition of the highest kind, and is even not inconsistent with great weight, as was proved by the Dorkings of the late Viscountess Holmesdale, so successful about thirty years ago. The question of housing is thus reduced to a minimum; all that is necessary will be as many as required of detached sheds, perfectly open on one side, dotted about at different suitable spots, which can be arranged so as to give some little shelter from the worst winds. These will form both shelters and roosting-houses, though some birds will probably roost in the trees. Exhibition poultry of the very highest class can be reared in any park in this way, without any formal or permanent outlay in the way of buildings and fencing.

Parks and large farms are, however, within the reach of few; and even where they are, health, hardihood, and condition are not the only points to be considered by the majority of people who keep poultry. The exhibitor pure and simple may wish for no more; but most people have to consider cost of food and value of produce. In these respects the free exposure system does not come out so well. This is well shown by the experience of a lady, published in an American paper. She had adopted for years the then usual American plan of closing up houses as much as possible in winter, and confining the birds in very bad weather. At last she resolved, even in that more severe climate, to try the open plan, and left one-half of her stock to roost in an entirely open cart-shed, even with the thermometer at zero, only in December hanging some old horse-blankets in front of them. Those in the houses continued to trouble her with colds; those outside had none, and were much the glossier birds, and had the larger frames. On the other hand, however, those outside ate a great deal the more; while those inside were a great deal the heavier, and began to lay about a month before the others. These results put the whole matter in a nutshell, and obviously bring us back in most cases to the habits of what we have termed "civilisation"; but in many cases the best results of both systems can be secured in all but the more severe of English climates. We must still, and at all costs, secure pure air; but we more generally want this in combination with shelter from the weather and outside frost, and freedom from direct draught or current of air, so easy to set up in a small house, and which is quite different in its effects from the free winds of the open plan.

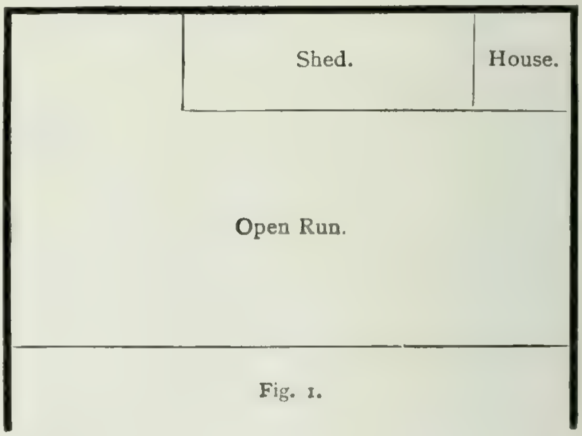


Fig. 1.

Small House and Run.

In considering how poultry should be housed, then, we will begin with the smallest scale, such as half a dozen fowls (more or less) to be kept at the bottom of a garden or back-yard. A long shed may already exist, and if so, will do excellently if in repair; otherwise comes the question of building the whole affair, which ought to be within the power of an average man. It will generally be better (with all due respect to the average British workman) if so built, and more according to what he desires. The best general arrangement will be as in Fig. 1, the house being in one corner, a roofed shed carried out at its side, and as much open run in front as can be afforded, or perhaps the whole yard. The house will be closed in; but the shed should be open in front, though with a closed end wall unless it runs all across, in which latter case it may perhaps comprise all the run which can be afforded. The shed should be boarded up a foot from the ground and netted above, that the few birds may be confined in specially wet weather; and the roof over all should project a little in front and have a gutter. A house four feet square would really answer, but this would hardly give enough shelter-depth to the shed, which will be far better six feet to the back; hence a small house may part off four feet wide from such a shed. Six feet is also best because most ordinary planks and timbers are twelve feet long, which will cut up without waste.

Building Small Houses.

Building such a small affair is very easy. If there is a back wall the matter is simplified. Quartering (2 × 3 timber) should be used for frame and uprights, and not less than ¾-inch for the boards. The back uprights should be clinched to the wall by staynails or holdfasts, and a horizontal piece of same section similarly fastened to the wall to support the back of the roof. The bottoms of other uprights can be tarred and sunk in the ground; but it is better to lay horizontal sills of quartering either on the ground or, still better, upon a "footing" made by a row or two rows of bricks laid side by side. Then halve or mortise all the uprights into the sills. There must be an upright at the corner of the house, and for a door-post, and at the gate in the shed, and its corner, and wherever else needed for strength. A horizontal timber will run all along the top of the front, and on to this and the back piece on the wall the rafters will be spiked down. The boards may be either tongued, or caulked by driving string into the chinks, or laths tacked over the latter. Tongued boards are best, and look neatest. The door must fit well, or rather, should be made so as to lap over the timbers all round.

For the walls, single-tongued boards are sufficient in ordinary climates. When more warmth and shelter are necessary, roofing felt may be tacked on outside and tarred, or what is probably best of all, an inner skin of thinner tongued boards may be nailed on to the *inside* of the frame-work timbers, leaving an air-space between. This is a very snug and warm and neat plan. There is a similar variety in regard to roofing. Loose tiles will give absolutely free ventilation, but will be, in many places, too cold for profit, though they will suffice for at least southern England. Galvanised iron is quite as cold, and does not ventilate, having, therefore, no merit at all beyond durability. Either of these, however, ceiled with thin match-boarding nailed *under* the rafters, is a warm and good roofing. Wood alone also makes a good roof. Feather-edge boards may be overlapped horizontally, and tarred periodically, or thicker boards, tongued or plain, may be laid edge to edge from the highest point to the eaves. This should be coated with hot gas tar in which a pound of pitch to the gallon is dissolved. Or the wood may be tarred, then covered with thick brown paper tacked down, and again tarred; or calico will be still better. Or the wood may be covered with roofing felt, or roofing paper, tarred annually. It cannot be too widely known, if durability be desired, that wood alone is useless for the roofs of poultry-houses in this country, since the best material will in time, owing to the effects of rain and sun, commence to warp, with the result that the wet, percolating the boards and dripping on to the litter on the floor, will soon make it unfit as bedding for fowls. Roofing-felt of some kind is essential, and, moreover, is cheap.

Flooring of House and Shed.

We come next to the floor of house and shed. Fowls will stand activity over wet runs, on which they only walk at their choice; but *cannot* be kept successfully in confinement for long, if the floor and walls of the house, and floor of the shed on which they depend for shelter, be not dry. However damp the ground, this can almost always be effected by digging and taking away till hard earth be reached, then putting on a layer of broken bricks, or stones, or clinkers, from one to two feet deep, in any case enough to raise the level six inches above the ground, and on this a layer of concrete made of hot fresh-slaked brown lime, and gravel or pounded clinkers. Sometimes it is better to use a dry mixture of quicklime pounded, gravel, and tar, the smell of which repels rats and mice. If there is definite cause to dread rats, however, it is worth while to lay small-mesh wire netting over the beaten-down surface of the drainage material, and below the concrete, and to carry it a foot up all the walls. A shed thus floored, and with the roof well projecting, and boarded up a foot or more, will be nice and dry. On the hard floor can be placed either dry earth, peat moss, road-sweepings, chaff-dust, oat husks or straw, to be periodically removed when contaminated.

On good, dry soil all this is not necessary. Mere trodden earth will, in that case, do for the house, and also for the floor of the shed; but in the shed some inches of earth should first be removed, to be returned in a loose state, after the subsoil has been levelled, and smoothed, and rammed down to a hard, permanent floor. This is the proper way to keep a shed—and especially a shed which constitutes the only run the fowls have—clean. To dig it up a foot deep every two or three weeks, as some do, answers for a period; but gradually the whole mass becomes contaminated to that depth, and the fowls begin to ail from the poisonous atmosphere. If *all* can be removed and replaced with fresh earth every three months or so, it will answer. But it is much easier and more manageable to renew merely a few inches of scratching material, down to a hard bottom, as above indicated. The removed earth or litter will be valuable for the garden. In the winter months it is a good plan to throw down a few bushels of chaff as well, or some straw, spreading it over the loose earth—it will keep the fowls scratching, and promote warmth.

Fresh-air Plans for Small House.

Let us next suppose that it is desired to carry out the fresh-air system in high degree, in even such a small house as here supposed. This can be done in several ways. A roof of loose (*i.e.* uncemented) tiles is one way; the air will escape quite freely, and it will only be needful to see that the birds on the perch are not in any direct draught from the entrance hole. This method is, however, rather cold for latitudes much higher than London. It is really warmer to have a tight roof, but to form the house and shed as in Fig. 2. The back A B, and ends, A C and B D, are closed; but the front, turned towards a sheltered or warm aspect, is only closed from D to E, E C being wired in, with a hole for entrance. The perch is at F G, in the most sheltered part, but facing the open shed. Here we have pure open air, and practically no draught, and the wind can only reach the perch from about the point C. Still more shelter can be secured by some modification of the above plan, such as we show in Fig. 3. Here the side of the house next the open shed is *partially* closed, E H; and the perch, F G, put back into the part most sheltered; the vacant space is, however, entirely open from top to bottom. No direct wind at all can reach a house thus constructed, and ventilation is entirely free and open, whilst the house will be many degrees warmer than the outer air, if the walls are good. Such a plan can be readily adopted in any buildings, on any scale, and will give shelter sufficient for almost any part of England: in parts of Scotland it might not suffice so far as the egg-basket is concerned

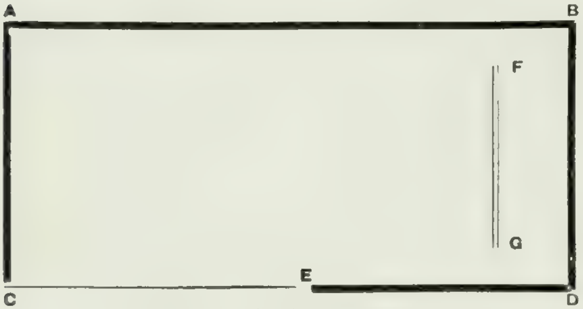


Fig. 2.—Semi-open House.

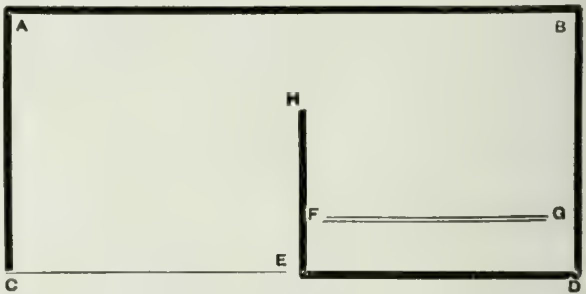


Fig. 3.—Semi-open House.

Warmth.

In regard to this question of warmth no rule can be laid down. If the house can be built against a wall at the back of which is a fireplace or stable, it will promote eggs in winter, and a genial aspect is also desirable, though by no means essential. In very severe climates, like the United States or northern England, some form of stove may be beneficial; but heat is generally overdone. The evil is that the birds then take cold on going out into the air. The lamp or stove should be so adjusted as not to raise the heat above about 50°, which can easily be done with a little care and thought. In such a house as Fig. 3 a plain petroleum lantern with a wire fence round may be used, with no ill result, owing to the free circulation. Experience has proved that if a few fowls are in a house and shed, and *kept* warm and sheltered—that is, day and night—a hen thus kept warm will lay better. It is heat *alternated with cold* which does so much mischief, especially if, besides the heat, the fowls also breathe (in a close house) the fumes from a stove.

Ventilation.

In most cases it is probable that the house will be closed in; then we must see to express ventilation, yet without any definite draught from one point to another coming upon the inmates. Usually the entrance hole will be at the front end of the side wall; then obviously we place the perch at the back side of the house, to be away from it, and the ventilator should be so placed that the draught from this entrance-hole to it does not cross the fowls. That is really the main point. The ventilator itself should be such that no strong wind can blow directly down upon the birds. Some louvre boards (*i.e.* like a Venetian blind) are good; so is a sheet of coarsely perforated zinc over a hole in the wall, or in the ceiling under tiles. The various patent ventilators have no objection beyond their cost.

A closed house should have a window of some kind. The fowls need to see what they are about, and so does the proprietor. One that can be opened will be all the better for the hot weather.

Perches.

Internal arrangements of a small house cannot be too simple, the essentials being ready access to everything, and easy cleanliness, the latter of which has, of course, much to do with the pure atmosphere we have been already considering. Perches should be kept low, and in a small house one is better than more. Active breeds may fly down from a high tree if they can have a long slant for the flight; but if not, they fall heavily, and in confined space much injury to the feet may be done by what seems quite a small height. We formerly used, and even advised, very broad perches, planed nearly flat, with only top corners rounded. Longer experience has convinced us that smaller ones are better, and that best of all are branches, with slight variations in size, and little irregularities and crooks (though taking off all prominent knots). These irregularities go a long way to prevent mischief, and the general size may run from 1½ to 2¾ inches diameter, according to the fowls. Perches should be loose, resting on a flat cut under each end, and should be lifted now and then and dressed, also the ledges on which they rest, with oil and paraffin, to keep away the red mite. They are better not more than twelve to eighteen inches high for large fowls, and two to three feet for lighter ones. Many, however, prefer to roost large Asiatics upon straw or fern. This will do upon the floor if it is perfectly dry, and the same straw will answer for several days if regularly shaken up with a stick and the droppings taken away from underneath.

Cleanliness and the Shelf Method.

With perches also, cleanliness must be constantly attended to. The floor should be freshly sprinkled every morning with earth, or sand, or ashes, or peat-moss litter, or chaff, or some other dry stuff, after taking up the droppings with a dust-pan and scraper. Or a board may be laid under the perch and similarly treated. But, for a small house especially, we know no better plan than one whose principle we took from the *Canada Farmer* more than thirty years ago; since then the publicity we have given to it has carried it all over the world, and experience still testifies to its utility. Its distinguishing feature is the broad shelf (*a*, Fig. 4), resting loosely at the ends on strips or ledges, at the back of the house, with the perch placed six to eight inches above it, a foot from the wall. The nests are placed on the ground underneath the shelf, and are quite protected.

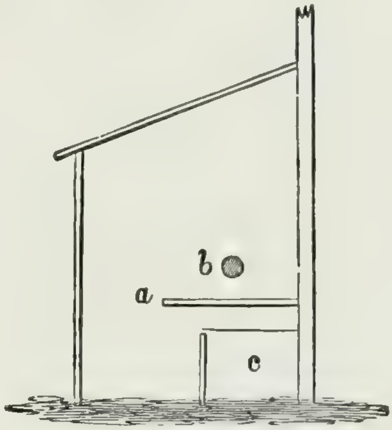


Fig. 4.—Shelf in House.

a. Broad shelf, fifteen or twenty inches high.
b. Perch, six to eight inches above shelf.
c. Nests under perch, open in front and on top.

A shelf of this kind under the perch offers many advantages. From its convenient height, it is scraped clean and sprinkled every morning with the greatest comfort, and preserves the floor almost entirely from pollution. It keeps perch and nests over the same portion of floor, thus making quite a small house more roomy. Another very great advantage is that it screens from all upward draught, and also intercepts radiation from cold or damp ground: it thus adds much warmth to such an arrangement as Fig. 2 or Fig. 3. If large Asiatics are roosted upon straw, it is also the warmest arrangement, in that case substituting straw for the perch. It must not be forgotten to lift the shelf now and then, and dress the ends and the ledges on which it rests with paraffin oil.

Dropping Boards.

In America the tendency has been more and more of late years to arrange such a shelf in a way to be more or less movable, under the name of a "dropping board" or, more shortly, "dropboard." In one set of plans before us, it takes the shape of a square table on four legs, about two feet high, which can be moved about when required, and above which the perches are suspended by perpendiculars from the roof. Fig. 5 shows an arrangement once in vogue in houses on the Reliable Poultry Farm, Quincy, Ill. Each board A A is about 5 feet square, and is hinged at the back to the sloping roof just above the low back wall. Above the board are the perches B B B. At the foot is a box or trough C C, loose on the ground. The board having ashes or road-dust sprinkled over it, the droppings fall in the box C C, which is made slightly wider than a shovel, so as to be cleared by one sweep of that implement; and in the morning the board is drawn up by the rope and pulley, and the box C C set back against the wall out of the way. The object of these arrangements is to leave all the floor space at liberty for the fowls, which is desirable in winter time, when they are confined. Another arrangement, said to be largely used in the eastern States, is a permanent flat shelf at the back of the house, about three feet from the ground, to the under side of which are fixed the partitions and front ledges only of a row of nests. Under these is hinged at the back another shelf, as a bottom for these nests. This arrangement also leaves the entire floor clear, and when the nests want cleaning or renewal of material, the bottom is let down, and everything falls to the floor, after which all is replaced clean. Before adopting any of these arrangements, ingenious as they are, it should be remembered that their main object is *floor space*, which is not so necessary in a climate where the fowls can run out, more or less, all the year. But their wide adoption is at least a proof of the great usefulness and convenience of the shelf method.

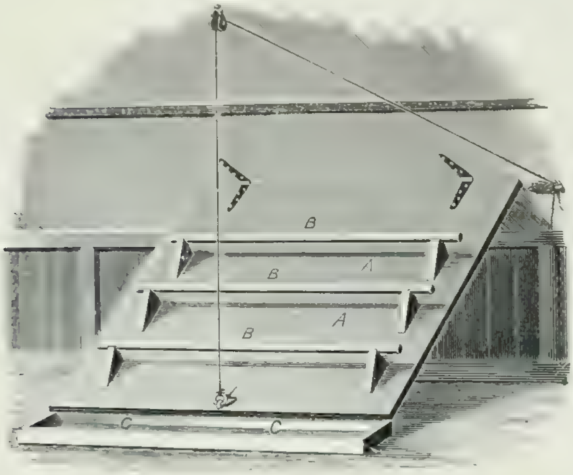


Fig. 5.—Dropping Board.

Little is really needed for nesting in a small house. Hens like some darkness and seclusion, but under such a shelf as in Fig. 4 a few bricks to confine a little straw will be sufficient. Otherwise a row of nests can be arranged by tacking together a thin board all along the top, thin partitions, and a strip three inches high in front to keep in the straw; this needs no back, but can go against the wall. The less wood, and cracks, and joins, the better. The old-fashioned tiers of nests are never used now. Half of a cheese-box on the ground makes a good nest. Complication, fixity, and harbour for vermin are the points to be avoided.

Portable Houses.

Sometimes no wall is available for even a small lean-to fowl-house. In such case the back uprights as well as the front ones must be halved or mortised into back sills, if they are to be tenants' fixtures; otherwise they can, if preferred, be sunk in the ground. But sill-work is really the best in any case, and makes it easier to raise the whole, and the floor, by a "footing" of bricks. The whole may be on the same plan, of a small house with shed at the side; or as Fig. 2 or Fig. 3 for ventilation. Ready-made houses for fowls are now made and sold very cheaply by quite a number of manufacturers, in a great variety of patterns. They can be had built for a lean-to against a wall; or entirely detached, with span, or circular, or slanting roofs. We have seen them advertised as low as 25s. for four feet square, but this is really too cheap for sound timber. They are packed flat for carriage, and readily put together by anyone at all used to even the simplest tools. There is one point about many of the smaller houses, common to all manufacturers; viz. that the floor of the roosting-house itself is raised a couple of feet from the ground, so that of itself it forms a shed or shelter for the ground underneath. A good pattern for rather a larger house than usual is shown in Fig. 6, the house being made rather narrow but long, so as to give more shed room. These houses are cheap, and often very useful, but two or three things about them need to be borne in mind. The first is, that the sizes given in most price lists are not

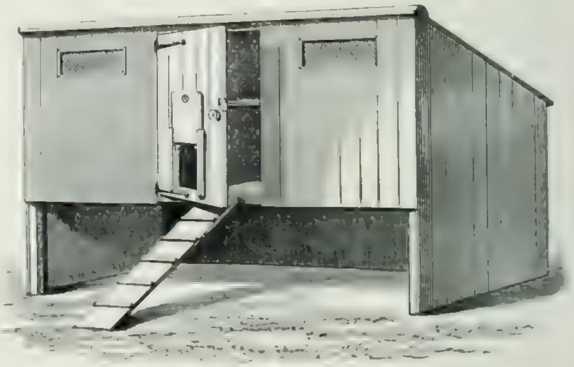


Fig. 6.—Portable House.

large enough for the numbers usually stated with them: thus a house four feet square is often given as "suitable for twelve fowls." It is nothing of the sort: more than half that should not be placed in it, unless small breeds on a wide range. Except on such a large run, or with some other shelter available, or in some sheltered position, such as a shrubbery, the area of the bottom shed is not altogether sufficient. With such adjuncts it may be; but care should be taken to raise the ground some inches, and special care to constantly renew clean dry dusting material, unless other dusting places are available. Another point to remember is that in snow or rain the fowls, crowding under the shelter, are very likely, at night, to remain there, rather than go out momentarily into the wet to go up to roost; this should always be looked after. Chinks may, not unlikely, open after a while in the floor, and cause draught: such must be stopped by some material if it is so. Even the entrance, in its raised position, is far more exposed than when on the ground; and such a house should therefore always be turned to a mild quarter. It is often convenient, and certainly better, as a rule, where ready-made buildings are purchased, to get a shed entirely separate, such as are also supplied by the makers of the houses.

Dust-bath. Somewhere in each shed, and in the driest part of it if any damp comes in anywhere, there must be a heap of fine dry earth, or road-dust, or finely sifted ashes, in which the fowls may roll and cleanse themselves from insect vermin — their only means of doing so. To answer its purpose this must be renewed every now and then, and especially never allowed to remain long if it gets damp. One plan is to part off a back corner of the shed about a yard square, by two boards about six inches high placed on edge, and to keep this place filled to the top. The only case where special provision is not necessary is where the entire shed floor is some inches deep in dry loose material, kept clean and renewed as above described. Then the fowls can use that at pleasure.

Small Space. Before leaving the smallest houses, it may be well to answer a question, often put to us, as to the smallest space in which it is *possible* to keep a few fowls, in health and to some profit; or the query often takes the form of asking how many can be kept in a "house" of given size, say five feet square, and a certain height. The number to be kept in these cases never depends upon the size of the house (though it would do so were the house in a park or large range), but on that of the shed and run. Taking medium-sized fowls, such as Minorcas, our experience taught us that the minimum was about ten to twelve square feet of *run* to each fowl; thus, half a dozen would need a shed, say six feet by twelve. But this supposes a shed kept perfectly *dry*, and an amount of cleanliness which many people would never dream of, with most careful dieting. Large fowls would need more, bantams less. Such confinement supposes that offending matter be taken out *every day* from the shed as well as the house, and no refuse ever left therein. With all precautions, such confinement is very apt to produce the vice of feather-eating; but this may not occur, and we are only speaking of health and profit.

Such small space must be all of it *covered dry shed*, yet with plenty of light and some sun, and cleanliness is easiest preserved by flooring it with some inches of fine dry earth, or sand, which is to be raked clean every day. A common rake will be useless; but by driving long and thin French nails a quarter-inch apart into the edge of a strip of wood, and then cutting off the heads with wire nippers to the same length, a rake is formed that will remove most of the offensive matter. The only other way is to scrape up an inch deep of the material, and sift it through a wire sieve. If once a run begins to "smell," it means disaster; and it is to be remembered that there may be no smell apparent to a human being, while a fowl, so much nearer the ground, may suffer from the poisonous exhalations. Disinfectants are of no practical use in this case; one bad smell does not remove the evil of another.

Double House and Yard. Supposing more space can be given to the fowls, it will be far better to consider, as the first claim upon it, a fair amount of *open run* in front of a single house and shed. The latter need not then cost nearly so much labour. On a yet larger, but still limited scale, the plan in Fig. 7 may be recommended from experience, having served us well personally for some years. It will be sufficient, if there is besides some other bit of shelter, and a lawn or grass run, or even another piece of yard, in which chickens can be cooped and reared for the first few months of their lives, to rear for exhibition a few fowls of such breeds as do not require separate pens to breed the two sexes. It consists of two houses, sheds, and runs such as above described, separated by a small open shed and run, which we used for sitting hens, and which also comes in handy for many other purposes. The plan as shown covers a space of thirty-five by twenty-five feet, on which scale the open yards must be gravel, sand, or trodden earth: grass runs would require far more, as presently mentioned. The houses are drawn as they really were, with nests at the back and the perches a little more forward; but to the same general plan can be readily adapted any of the arrangements shown in Figs. 2, 3, and 4.

Care of Small Runs.

Such a plan as this leads us at once to the consideration of some further points, each of practical importance. The first is that of the preservation in healthy condition of limited runs. Though so much labour is not needed as when a small shed is the only space the fowls have, care is still required, else the runs will get into a foul condition, and disease follow. It is best to let the surface be trodden solid, when once a week or so the greater part of the offending matter can be scraped loose, swept up, and removed. This should also be done on a gravelled run. Once a year half an inch or so should be pared off the top with a spade, to be crushed and used as manure, a corresponding quantity of fresh earth being thrown in and spread over the surface. If every two or three years the run be dug up, with these aids it may be kept healthy for a long period. Disinfectants are of little use, and dangerous. Some people prefer to let the loose earth alone, and dig the run over every six months or so. This plan will generally answer for four or five years, or even more; but as there is no crop to consume the manure, the poison is apt to accumulate by slow degrees in the mass of earth. Soils differ, however, and in some cases a good loamy earth seems able to deodorise all that is thus dug into it. To help this, it is well to confine the fowls to the shed for a week after the winter digging.

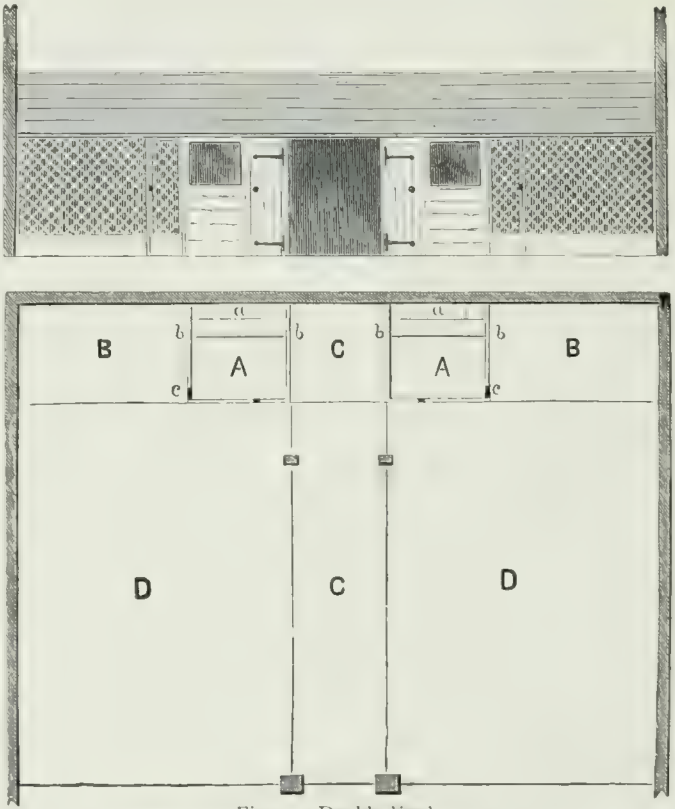


Fig. 7.—Double Yard.

A A. Roosting and Laying Houses.
B B. Fenced-in Covered Runs.
C C. Shed and Run for Sitting **Hens.**
D D. Grass Runs.
a a. Nests.
b b. Perches.
c c. Holes for Fowls **to enter.**

Grass Runs.

We have next to consider grass runs. These are the best of all for poultry, giving natural green food at nearly all seasons in England (not in America), and also exercise and more or less insect food. Where space can be given for grass, no single condition will do so much for fowls and owner; but it is no use attempting grass *unless* there is adequate space, and a great deal is required. Experience taught us very early that in England one hundred and twenty fowls required an acre of run if kept on it permanently; and the larger breeds should not exceed one hundred per acre. But this is not the best way of using the land, which will be kept healthier in the long run by overstocking it to the extent of even double, provided each run can be vacated for three months every year. This also brings runs into more compact compass, and so we arrive at a grass run of about twenty-five feet by fifty feet for a pen of six large Asiatic fowls.

A run of this reduced size, thus tenanted, will last for several years, even when occupied without cessation, with no apparent detriment, if constantly attended to; but it does gradually become "sickened," unless it can be vacated for freshening and purification. Amongst a number of runs this can be managed, either by three months annually, or six months bi-annually. This time need not be wasted wherever grass or hay can be used, as a crop may be taken a week or two before the tenants are returned to it. The runs will also need mowing tolerably often, even while occupied; since, although too over-crowded for safe permanent occupation, this does not mean that the grass is kept down. Near the house it may be, but less so the farther away; and it must be mown whenever it is long, else the fowls may get balls of long tangled grass in their crops, and may eat blades of it, part of which are contaminated. Such fouled grass is simply poison. All this is avoided, worms and insects made more accessible, and the droppings more quickly washed into the actual soil, to be absorbed, instead of adhering to the grass, by proper mowing as required. *Keeping the grass constantly mown short is the one matter of greatest importance in the management of limited grass runs.* Grass cut during full occupation should be burnt, and the ashes mixed with the other manure.

Regular cutting is of equal importance to runs meant to be constantly occupied, and which are therefore of larger size. Much grass will then grow to waste, yet the conclusion must not be drawn that so much space is not needed; long experience has shown that it is, if the tenancy is to continue longer than five to six years, up to which time a crowding of considerably more than the hundred per acre may generally be carried on without apparent harm. But somewhere about that time Nemesis comes, and often with no apparent warning.

Mortality in Over-crowded Runs.

The reason of these results from over-crowding grass runs was demonstrated by Dr. Klein, the well-known bacteriologist, who investigated the mortality upon a "poultry-farm" at Orpington, where four hundred to five hundred birds were habitually kept upon two acres of land, or more than double the number above laid down. The birds would be apparently well even thirty-six hours before death; then were attacked by a thin yellow diarrhœa, became sluggish, and in a day or so died. On post-mortem, the spleen was found greatly enlarged and soft; the liver also enlarged and disorganised; the coats of the intestines considerably inflamed. The blood was swarming with bacteria, which, being isolated in pure cultures and cultivated in the usual way, caused the disease in about five days when inoculated into healthy fowls. The bacteria also swarmed in the evacuations, and it was found that fowls given food polluted by these evacuations were also attacked by the disease. All becomes perfectly clear in the light of these facts. Without discussing how the disease *first* arises—and many bacteriologists are now of opinion that germs ordinarily innocent may by changes in the surrounding circumstances become modified into deadly varieties, a process itself more likely to take place under any unhealthy conditions—it is only necessary to suppose *one* fowl acquiring or importing such disease, and the more crowded the run, the more surely and rapidly must one fowl after another pick up the contamination in its food.* This is all the more likely with rather long grass, which preserves the evacuations from being washed into the soil, while it is constantly eaten by the occupants. Hence the inferiority in healthiness of even a large run *constantly occupied*, to a smaller one, even less than half the size, which can be entirely vacated for some months, and have a crop removed every year.

Climate and Grass Run.

In America, smaller grass runs appear to be found more satisfactory than we have stated; but the reasons are pretty plain. As a rule they are necessarily vacated during the winter, the fowls being reduced in numbers and confined in sheds, owing to the severe climate and the snow. The ground vacated is commonly ploughed up and sown with winter rye-grass, which thoroughly sweetens the soil and consumes the manure by a regular crop yearly. The soils, again, are very generally somewhat light and sandy, which carries out these natural processes more rapidly. Lastly, the climate as a whole is *dry*, both in summer and winter. The enormous difference this makes we may see by considering the case of a guano island, where the sea-fowl have lived for generations upon ground actually composed of their own evacuations. These are dried up in the sun and dry air, and cease to exhale poison in that desiccated state. In England, all is more or less moist, if not wet, which means active pollution in every way, air as well as ground. If these climatic differences are considered, it will be easily seen that methods excellent in the States and Canada and worked with success there are not always practicable in Great Britain.

Though a very small plot of grass cannot bear permanent tenancy; it may, however, be of considerable use. A few weeks on such a plot will freshen up two or three exhibition fowls considerably, or will keep a cockerel, with one companion or not, in high condition for some time. And at all times of the year it will be useful to *grow* grass, the best of all green food, and especially to be cut into fine green chaff for young chickens as described farther on. For mere health, a grass run is not at all necessary, provided proper care be bestowed on cleanliness and diet; and it is far better to add the space to earthen or gravelled yards, than to attempt grass under conditions in which it cannot be used with real benefit.

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* As mentioned elsewhere, Dr. Klein fortunately discovered that an anti-toxin could be prepared from the germs, which prevented birds inoculated with it from being attacked.

Shade in open grass runs is very desirable, and of course it is just as well to get something out of it at the same time. Fortunate are those who have an orchard at command. Standards of bush fruit do well in runs for young chickens, and make the best of shade and scratching-places; but larger birds would, of course, eat the fruit. Filbert coppice is good, and often profitable. But as a rule, where permanent occupation is likely, dwarf fruit trees pay best.

Fencing.

Fencing has next to be considered, and what is best, or necessary, will depend a great deal upon circumstances. In fencing any yard where runs adjoin, it is very desirable that the fowls should not be allowed to see each other; it keeps cocks from fighting, and young cockerels from fretting and excitement. With very wide and scattered runs this is not necessary. Height, again, has to be considered; three feet will confine Cochins or Brahmas, and four feet may suffice for Langshans or Dorkings; but even six may not retain Game or Hamburghs.

The cheapest general material is plain wire netting. We remember when two-inch mesh netting cost 6d. per yard: it can now be obtained at 6s. 4d. for a roll of fifty yards 3 ft. wide.* This will be of light gauge wire, No. 19, which, however, may suffice for many purposes where a fixture; but if durability is desired, and especially if fencing is to be removed (for periodical crops of hay or grass), stout wire is cheaper in the end, and will run up to about 13s. per roll for No. 16, other prices being intermediate. For extensive fencing the cheapest plan is to drive stakes into the ground, 1½ to 2 inches square, the stoutest size every twelve feet apart, and smaller ones half way. To these the netting is fastened by small galvanised staples if a fixture; but if removable, placing them on or lifting them off small, headless French nails, driven in at a downward slant, so that the wire rests in the angle. There must be no rail at the top, only the selvage of the netting; but if desired, a long fence may be strengthened by stretching a barbed wire all along the top from stronger iron posts at the corners of the run. Something in regard to lateral rigidity and strength of the stakes will depend upon the winds to which the locality is subject. Thin boards can be fastened to the same stakes by large tack-nails: three nine-inch boards will run up twenty-seven inches, and any required width of netting may go above that. Large runs should be so planned that fifty-yard rolls will cut up evenly, especially if intermediate fences are removed during vacation.

Having driven many wooden stakes for fencing in our time, a few words may be useful in regard to the best method. They should be pointed with long points, and tarred some days before driving. An iron tool should be provided, which we will call a "perforator," somewhat smaller than the end of the stake, and a somewhat similar taper at the end: a piece of iron tube, with a solid head and point welded in, is lightest to handle. When boards are used for the lower part, one of the boards is used as a measure, the "perforator" being driven in by a heavy hammer at such a point that the end of the board will come over half the stake when driven. The "perforator," being driven deep enough, is loosened by side taps and withdrawn, when the stake itself is driven into the hole thus made, this time using a mallet. We tried several ways, but found this much the best, and the special tool well worth its cost. Iron stakes with prongs may also be used, and the wire tied to them. Such stakes blacked will cost about 13s. 6d. per dozen six feet high, or about 20s. 7d. galvanised; four feet high may run about 6s. and 8s. respectively.

The same fencing will be cheapest for small runs if home labour be employed in putting up; but where this is impossible, various patterns of poultry-fence and hurdles sometimes come cheaper in the end, owing to the saving of labour, though much more costly in themselves. A fence made in hurdles six feet long and six feet high, with match-boards near the ground and two-inch wire above, will cost about 3s. per yard, with bolts and nuts; gates or doors from 3s. each. These fences only need fixing in the ground by their pronged feet, which most people can manage.

On a farm or other wide range, hedges and other fences will be used as far as possible. A very imperfect hedge may often be made into a thoroughly efficient fence by simply running twelve inches of wire netting along the bottom on one side, which is easily kept in place by stout galvanised wire stakes threaded through it and thrust into the ground. This will only cost three or four shillings for fifty yards. The netting should not be placed on the inside of the hedges all round a field; the use of one hedge at least being left to each flock for shelters and dusting-places. A periodical examination of such fences for weak places is desirable.

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* These and the other prices quoted on this page were the prices ruling in 1910.

Larger Poultry-yards.

For extensive establishments, such as will be required if breeding for regular exhibition be carried on, or a regular demand for eggs or stock is to be supplied, a great variety in arrangements is possible. Where unlimited range is at command, it has already been hinted that there is perhaps no better plan for securing success in these objects than to scatter about in sufficiently distant and distinct localities a number of detached houses. On some estates no fencing at all may be required, the laying out of the estate keeping the flocks sufficiently separated; but if fencing be necessary, a small expense in wire netting will do all that is requisite. There will usually be ample shelter and dusting-places in shrubberies or plantations or under hedges, wherever such methods are possible; hence such houses as are shown in Figs. 2, 3, 4 will answer all purposes; or even a large hogshead with the head knocked out, turned on its side upon four bricks, with a floor fitted in near the bottom side, and a perch near the back end, may be enough for a breeding-pen of fowls if placed in the shelter of a copse or shrubbery. Such a plan has the advantage of gratifying a pleasant hobby without sinking large sums in permanent buildings; and it is a pity that the cases are so few in which it can be followed. The only drawbacks are, that while the bloom and health of the fowls will be magnificent, the egg yield will probably not be very great, and much time will be occupied in going round and attending to the stock.

A more compact arrangement of runs must be the usual plan in this country, even where grass is at command. In this case, also, many poultry-keepers of great experience prefer, having divided the ground into runs of the required size, to place a small detached wooden house in each, somewhat as shown in Fig. 8, though the actual plan and arrangements may vary widely. Portable houses, such as Fig. 6, are often used in this way. The objection to this plan is that, unless the houses are a great deal larger than necessary, the shedding underneath is too small, at least so far as concerns exposed runs: shrubs or trees might supply the lack. Otherwise it is better to incur the cost of separate sheds, C, as well, for the other ends of the runs. This plan—we mean of having the house at one end and the shed at the other—also has the advantage of inducing the fowls to use more equally a range of long and narrow runs, which is often the most convenient way of plotting out a piece of land, or of visiting all the houses in order. Of course no such exactness of arrangement is necessary. Aspect has to be considered, both as regards the houses and the sheds; and in many cases, by arranging the shed so that one corner meets one corner of the house, a judicious choice of position and angle will give a maximum amount of shade and shelter to the birds, a matter which should always receive thought when a number of runs are in question. As a rule, such contiguous houses and sheds are more suitable for runs approaching a square in shape.

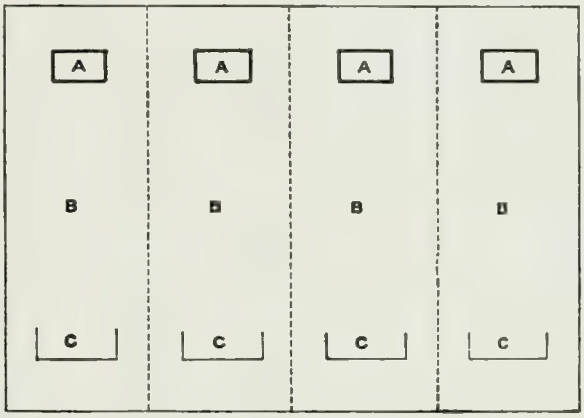

Fig. 8.—Detached Houses in Runs

A A. Roosting-houses. B B. Runs. C C. Open sheds.

Ranges of Buildings.

Ranges of houses and shedding are, however, more usual, and generally more convenient, saving much in time, and labour, and exposure of the attendant in bad weather. The chief practical difficulty in planning such buildings is that, unless the cost be incurred of more house and shed room than is necessary, it makes a grass run so narrow in proportion; fowls do not use a very long and narrow strip of grass to the greatest advantage. Bare earth yards will be shorter, and to them the objection does not so much apply. Thus, a house five by six feet, and a shed ten by six feet, will occupy the end of a run fifteen feet wide, and a bare earth or gravel yard twenty or thirty feet in front would be in good proportion. But a grass plot must be seventy or eighty feet long for a pen of say six fowls; and though it may do, this is not a desirable proportion.

This difficulty may be met, and probably a set of buildings erected with the minimum of material for the same amount of accommodation, by planning a range of buildings for the centre of a piece of ground, as in Fig. 9. Each of the eight pens here provided has a roosting-house A, six feet square, and a shed B, twelve by six, so as to use twelve feet boards throughout. Such a group of buildings, in the centre of say half an acre of land, will give well-proportioned runs C C, and offer great capabilities of practical work, with great economy of material; the houses being in the centre will have the greatest amount of warmth at night and coolness by day, or may be left half open, on the plan of Fig. 2, still giving ample shelter. An attendant can also see to the whole series under the shelter of the outer sheds. On the other hand, this plan does not admit of extension beyond eight houses and yards, while buildings in a plain row, though subject to the difficulty above mentioned, may be developed to any extent desired.

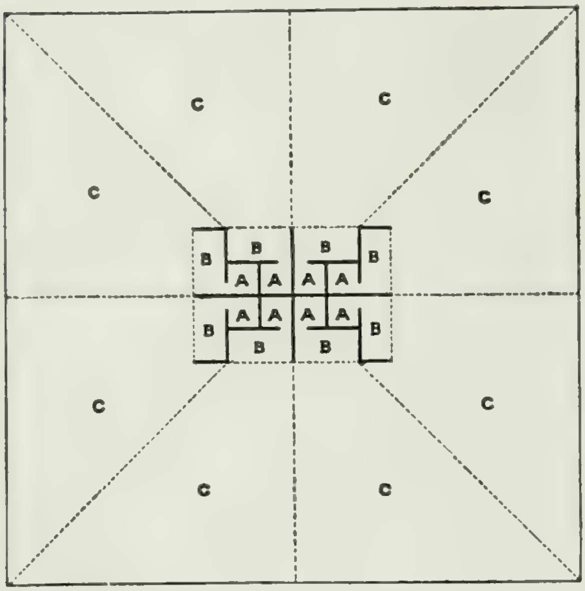

Fig. 9.—Plan for a Central Range of Buildings.

A A. Roosting-houses. B B. Sheds. C C. Grass runs.

The Corridor Plan.

In regard to such ranges, or rows of houses, what is known as the "corridor" plan gives the maximum of comfort and convenience, at a little more cost of space and material. The very first example of this plan, so far as we have been able to learn, was a house erected for his Spanish fowls by the late Mr. Henry Lane, of Bristol, which was figured in the *Practical Poultry Keeper* of 1867, and has thence been widely imitated and further developed, owing to its obvious advantages. The outer walls were of brick. A covered passage, A (Fig. 10), ran along the back of all, and, by a door in each, had access to any of the roosting-houses B B. Mr. Lane had the passage warmed by hot-water pipes, *aa*, which were however only used in frosty weather. Spanish combs are particularly apt to get nipped at such times, and for them the pipes were no doubt useful, employed with judgment. They are also commonly used in America; but only in northern latitudes and for certain breeds can they be necessary in Great Britain. The passage was sky-lighted, and had free ventilation at the highest point of the roof; the doors at the ends of the passage were not meant to be left open, on account of draught, unless in the very hottest weather. Each house, B, was seven and a half by four feet, and the sides facing the passage were only boarded up about two feet, the remainder being wire-netting. Thus the birds had a free supply of pure air, while quite protected from the weather, and could be inspected on their roosts at night without disturbance. The nests were reached from the passage by a flap, thus the house was never entered except to clean it or to handle a bird. A small trap-door as usual communicated between the houses, B B, and outer open sheds, C C, enclosed, however, by netting in front. These sheds measured seven and a half by nine feet each, and were floored with about two inches deep of powdery lime-rubbish from the kilns. This was of course air-slaked, and suited Spanish very well, keeping perfectly dry and lasting a good while when properly looked after; but it would ruin the colour of any yellow-legged breed. In front of all were two grass runs, into which any pen could be turned at pleasure. Each pen was itself thus only seven and a half feet wide, which would be sufficient for Spanish, but not for many other breeds. Arranging the shed thus, in front instead of at the side of the roosting-houses,

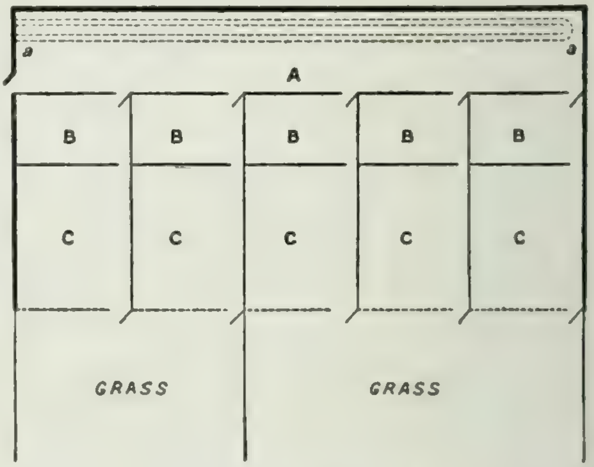

Fig. 10.—Mr. Lane's Yard.

a a. Hot Pipes. A A. Corridor. B B. Roosting-houses. C C. Shedding.

gives the very narrowest form of the system; and the grass runs were kept wider by allowing one run to two or three pens, which had its use in rotation.

The systematic poultry-breeder, however, requires a great deal of accommodation besides the sheds and runs for his actual breeding-pens or flocks of chickens, and by bringing the space for this into his range of buildings, he can easily adapt the corridor plan to fairly proportioned runs of grass. After a quarter-century of further experience and examination of numerous establishments, we still find it impossible to do better than repeat here, as an example of thorough comfort, facility in work, and general usefulness in a range of buildings, the range of houses and runs we designed for our own use in 1872, and which, since we published it, has also been extensively used all over the world. Indeed, either the single- or double-range "corridor" plan, with modifications according to circumstances, is probably the most used of any, where a regular range of buildings is decided upon.

In this plan (Fig. 11) a single passage P P runs up the centre, between ranges of house and shedding on each side, this passage being three feet wide. The entire building covered seventy-five feet by fifteen feet.* The double-pitch roof was covered by loose tiles, the corridor being simply lighted by inserting glass tiles at intervals. There was sufficient frontage each side for three grass runs, or six in all, each twenty-five feet by fifty-five feet, which comfortably accommodated five or six Brahmas, or a selected lot of cockerels or pullets; but only five were occupied, in order to give every such run two months' rest in the year. The shedding on each side, six feet deep from front to back, was used as follows: The roosting-houses A A were five feet wide, entirely enclosed by match-boarding on the side towards the run, and at the sides; but the side fronting the corridor was only boarded up three feet high, the rest being netted. The sheds B B occupied twelve feet more; these were open (except netting) in front, but boarded up like the houses for three feet high next the corridor, and netted above, so that from the corridor everything could be seen. The remaining eight feet of shed fronting each run was occupied by two small houses D D with small pens E E, each four feet wide, of which there were, therefore, twelve in all. Of these every breeder knows the need; we used them for sitting hens, single cockerels which needed penning off, one of them for a hospital, etc.

As to internal arrangements, the perches *c c*

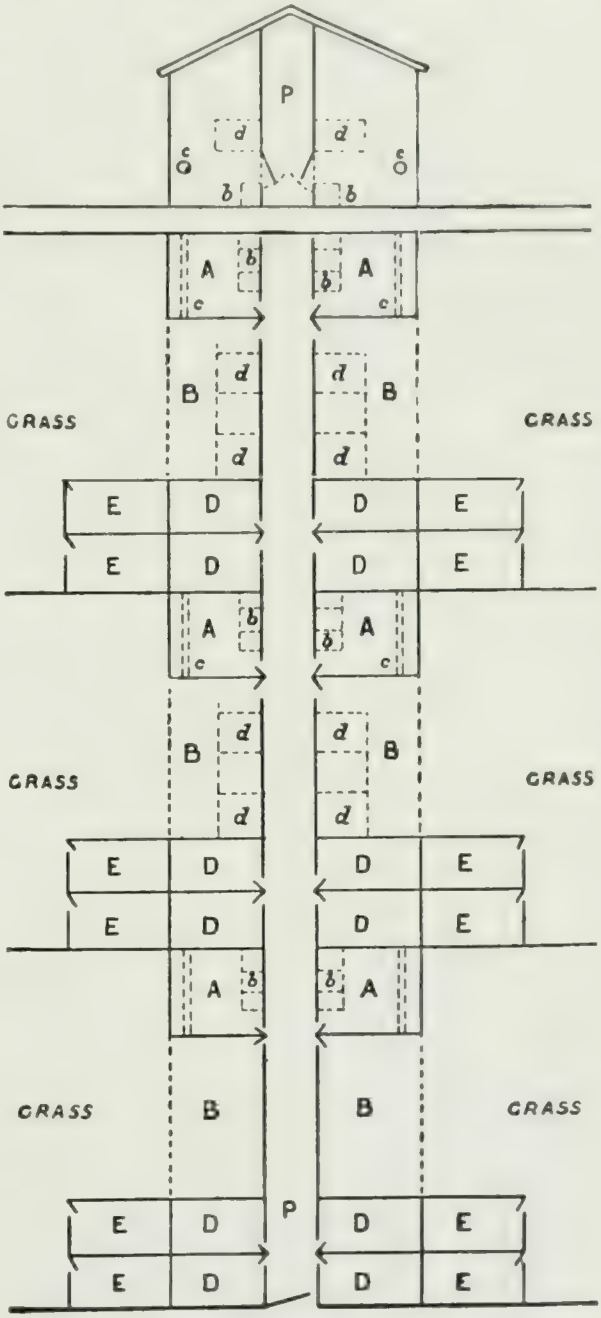

Fig. 11.—Double Range of Fowl-houses.

A A. Roosting-houses.
b b. Nests.
c c. Perches.
d d. Training-pens.
B B. Sheds.
D D. Small Houses.
E E. Small runs to D D.
P P. Corridor.

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* We had the timbers put up and the tiles put on by contract, in order to be sure of a roof to work under in wet weather. The whole of the remaining work was done personally, during a three weeks' summer holiday; every door and gate being made and hung, every stake driven, every board fixed, every hinge and latch put on, by our own hands. Hence the money cost beyond material was but small.

were near the closed back of the houses, the nests *b b* next the corridor, where they could be reached through a flap-door. The training-pens *d d*, for specimens to be exhibited, were nearly three feet square, and we provided for them by running back a floor from the top of the yard-high boarding in the corridor; thus the floor of these pens was three feet above the ground, at the backs of some of the sheds B B. Each row of pens was well boarded up behind, with wire fronts; thus they faced us on each side of the corridor, at a height of three feet, and occupied no extra room at all. Everything except mixing of the food, and the very young chickens, which had a separate yard, was thus collected under one tiled roof; as these also might be if desired Ventilation was free and perfect, and we never remember a case of roup or catarrh in the place. In a very cold locality, however, it would be necessary to have a ceiled or close roof, with definite ventilators, to stop radiation of heat. Any corridor house can also be easily heated if required; and heating will be less injurious in a house of this kind than in any other.

Scratching-sheds in America.

Of the many large establishments for poultry culture which exist in America, it will be of most interest and value to notice certain features of construction which are, in one form or another, typical and general, because of their relation to climatic differences, and especially to the necessity for keeping the fowls shut up under cover for months together during the winter, and to the intense cold. Fifty years ago the few who kept any number usually confined them in very large houses, or barns, which gave the requisite space. This was found too cold to promote winter laying, however, and by degrees there spread the system of a separate shed by the side or in front of the roosting house, as is so common in England. But while with us the shed was chiefly necessary for merely temporary shelter, in America it had to give exercise during entire confinement for protection from the weather. Hence it is termed a "scratching-shed," and under that name is becoming almost universal in good poultry plants. In order to use as much as possible of the short and precious winter sun, American scratching-shed houses, or ranges of houses, almost invariably face the south, and are highest in front, sloping to the back, so that the sun may shine in. Besides the wire front which confines the birds, it is usual to provide movable fronts of thin canvas, oiled or not, which are kept over the fronts during wet or snow, and drawn up during dry weather; these admit ample light, but keep the shed dry. In localities where the climate is very severe some have the front closed by wood and glass, which can be raised in summer so as to be quite open.

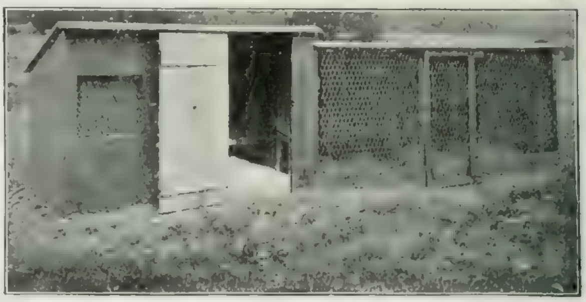

Fig. 12.—Portable Scratching-shed House.

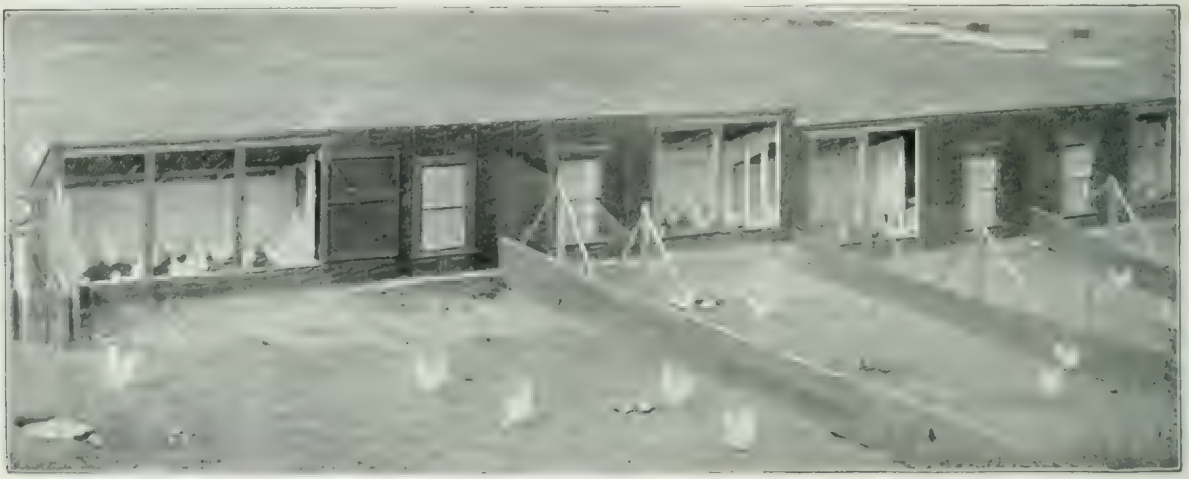

Fig. 13.—Scratching-shed Houses of Mr. A. F. Hunter.

Fig. 12 shows a portable detached scratching-shed house, as used on many large American poultry establishments. The house and shed are separate, each being ten feet wide and mounted on runners, so as to be hauled about when required, and the doors are shown thrown wide open as in summer. Ranges of houses upon the same plan were used on the same farm, with yards 20 × 100 feet in front of each. Such ranges are very commonly erected upon a plan figured and recommended by Mr. A. F. Hunter, formerly editor of *Farm Poultry*, and put up by him on his own farm at South Natick. In Fig. 13 is given sufficient of such a range of houses, from a photograph, to show how they are built in pairs. The size in this case is 8 × 10 feet for the closed house, which has a very large window, and 10 × 10 feet for the shed at the side, the yards extending 125 feet in front of each. A feature of this range of buildings is that all partitions, between houses and sheds, and the contiguous pairs of each, have double swing-doors at the front end, and fly back by a spring to the proper position. Thus the attendant can walk along the front of all, by pushing open the doors and letting them swing back behind him, with as little disturbance as possible to the hens which may be in the nests or roost at the back. This construction of a long range with high front, low back, and swing-doors all along the front, is generally known as the "Hunter scratching-shed plan." The fowls roost at the low back of the closed houses, and in very cold weather it is customary to draw down curtains in front of the roost to confine the space and check radiation.

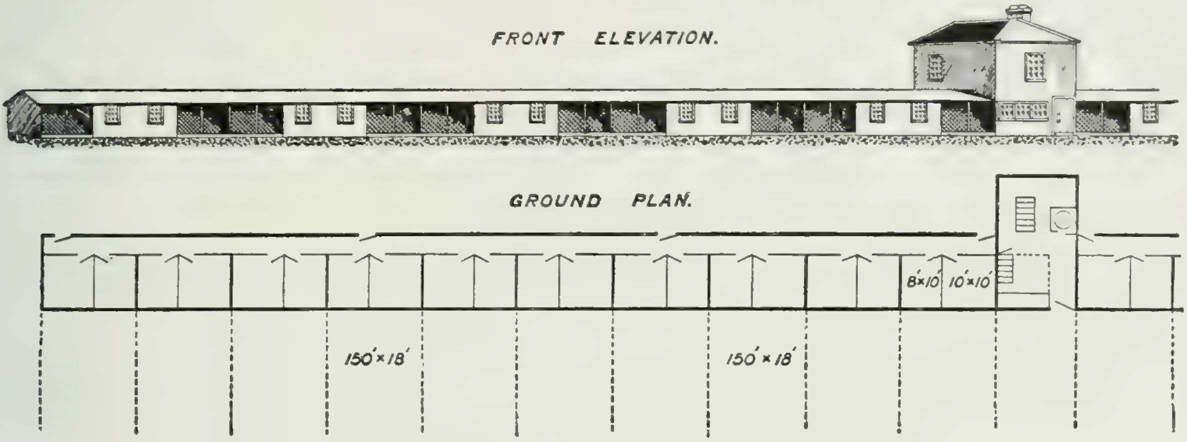

Fig. 14.—Mr. C. H. Latham's Poultry Plant.

Scratching-Sheds with Corridor.

Many of the most practical poultry-farmers of America, however, and especially some of those running the largest establishments, find the numerous swinging-doors of this system intolerable. Some of them prefer the detached houses of Fig. 12; others have tried halving the doors by placing the shed in front of the house as in Fig. 10; this, however, narrows the yard far too much, as already hinted. The majority who keep large numbers prefer the "corridor" plan, and endeavour to combine it with the scratching-shed. In itself this presents no difficulty, and Fig. 14 gives an elevation and ground plan of half a building put up by Mr. C. H. Latham, who reared Plymouth Rocks at Lancaster, Mass., showing one of the two wings, each 180 feet long, stretching out from the central food and cooking-house. Mr. Latham had been in the business a long time, and previously built two poultry plants; for this, his third, he moved to another location a little way off to begin *de novo*, with the expressed determination this time "to build right," according to his light and the experience he had acquired. The timber houses are raised a foot above ground upon a stone and mortar foundation, as is usual in the best American establishments. Each pen has a closed house 8 × 10 feet and a shed 10 × 10 feet, facing south; and at the back, or north wall, is a corridor four feet wide. This is not wired at all, but solid board all along and over, so that when closed at night it forms a dead-air space to keep warm. From it a door opens into every house and shed, and there is also an outer door about every sixty feet into the corridor from the outer waggon-drive. Feeding and watering are all done from the corridor, the mash being placed in a trough which rocks back towards the corridor for filling, and then falls back by its weight into the shed, at the same time closing the aperture; the water-pan is also put through a door on to its shelf. The corridor wall also has shuttered lattices which can be opened in hot weather. The roof is a pitched or gable one, as shown. One length of fence between the outer yards, next the buildings, is made to lift out, so that a team can be turned in to plough up the runs when required. To the south of the enclosed yards are three acres of grass run, and at the north five acres more; and it was stated that the owner was able to run the whole establishment himself without difficulty; a statement which certainly gives one an impressive idea of the activity and energy of American poultry-farmers.

This plant—a good example of the corridor system as carried out in America, where the double-range is impracticable owing to the real need for southern aspect—was however alleged to have serious disadvantages, as pointed out in various poultry journals, which upon the whole criticised it favourably. The greater height at the back increases the cost, as does the solid wall of the corridor. The greater height of the roost was also said to be less warm. But chiefly, in a really severe climate, the high centre roof is said to retain a bank of unsunned, cold, unsweetened air.

These details have been selected, not with any delusive idea of presenting a complete picture of American practice, but as showing the careful and systematic study given to problems connected with climate, saving of labour, or the well-being of the fowls. From this point of view they may prove useful and suggestive, and perhaps stimulate invention or contrivance in other circumstances widely different. We need only add that in America the double-board system of building, with a dead-air space between the two skins, is very widely practised for the sake of warmth, which has an importance far greater than in England. Some prefer to make the inner skin of lath and plaster, as better for lime-washing, giving less harbour for insects, and warmer than plain boards. Linings of building-paper under or over the boards are also commonly used.

Utilising Existing Buildings.

Local buildings or accommodation are, of course, often at hand, and may be largely utilised. The extensive yard of the late Lady Gwydyr, figured in the earlier editions of this work, was founded upon some modification of the extensive buildings and shedding of the home farm, all of which were devoted to the purpose. The most remarkable example we ever came across, however, was in the case of the late Mr. Henry Beldon, once invincible as an exhibitor of Hamburghs. Many of his birds were reared on farms around; a good system, followed still by many breeders in the country, and even by a few in towns, but altogether depending upon integrity on both sides to carry out satisfactorily. But he had also in addition a deserted cotton-mill, containing four floors, each one hundred and twenty feet by thirty feet. One floor was of wood, the others concreted; and they were divided into pens, the smallest about ten feet square, and well lighted by windows. When well matured, Mr. Beldon found no difficulty in keeping birds even for months on these floors of the old mill, till wanted for disposal; with the help, of course, of proper litter underfoot and care.

We only need add a few miscellaneous hints as to planning and putting up a range of buildings. We have already advised regard to the standard length of twelve feet for timbers; but it is worth remembering that it will add scarcely anything to the cost of material if all the six-feet boards are ordered cut to that length, ready for nailing on, while it saves a great deal of labour. At some timber-yards the price "per square" (100 feet) would hardly be affected at all. There should also be plenty of doors and gates, as it saves time to be able to get about from one house or run to another in all convenient ways. Again, let these be *wide* enough to take a basket or basket-coop through easily, occasions for which may often occur. Where the corridor plan is not adopted, it is best to arrange all the doors in line through a range of buildings, on Mr. Hunter's plan, so that they swing back both ways into place and stay there; this saves a great deal of time and trouble.

CHAPTER II.

THE SCIENCE OF FEEDING POULTRY.

Purposes of Food.

THE scientific basis of a proper diet is better understood now than formerly, and its real principles may be explained in a way not only easy to understand, but to *work upon*, which is the object in view. All who read at all now understand that life, from the physical standpoint, consists of processes which involve constant change of substance and consumption of material. That consumption must, of course, be replaced; and thus a certain amount of food is necessary merely to keep or maintain the body in its normal condition. Still more food must be required if *growth* or increase of the body has to be secured as well; and yet further food, if any *products* of the organism are to be maintained—such as milk, or eggs; which, however, are a kind of growth. Yet further, it is well known by experience that any special activity, or *work*, involves more or less wear and tear of the tissues, and so requires proportionately more food; and also that more is required to maintain the *warmth* of the body under unfavourable conditions. Greater supplies of food than are necessary for these, so far as they can be assimilated, are stored up in greater bulk of muscle, and in fat; which superabundant tissues are the first to waste, or be consumed, in an animal "starved" either by privation or disease.

Food, being thus required partly to make up waste of tissue, partly to supply energy for work, and partly to supply fuel for heat, must contain in due proportion the elements of those tissues, and those necessary for combustion. It must also contain these in a form that can be digested, since mere chemical composition is not enough. An ox, for instance, can live on grass, or the stalks of grain, and man cannot; but when the same elements have been elaborated into the *seeds* of the grain (corn), these when cooked form one of man's principal foods; or yet again, he can eat the ox itself. We know broadly, however, what foods can be digested, and are here concerned mainly with their composition, and that of the animal body whose needs they are to supply.

Composition of the Body.

Taking such an animal body, by far the larger portion of it consists of carbon, hydrogen, oxygen, and nitrogen; in less quantity it contains sulphur, phosphorus, and calcium (or lime: it is well known that much of the bones consists of lime phosphate); and still smaller quantities of iron (chiefly in the blood) and of salts containing chlorine, iodine, potassium, and magnesium, with traces of other elements probably not essential. Of all these elements, *nitrogen* is of the first importance, and is the most distinguishing feature of animal or conscious life and activity. Itself a very inert chemical element, it appears to group round itself the various other elements, controlling and organising their constant changes and recombinations. In these offices it is consumed, the more rapidly in proportion to the activity of the animal. The carbon, hydrogen, and oxygen are obviously chiefly employed in maintaining energy and supporting combustion.

Considering food and its disposal in the body, we must not suppose that the nitrogen is consumed entirely or chiefly in replenishing direct waste of tissue. That is a popular error, but a great error. Some of it does go to repair actual waste of tissue; but the larger part appears to be consumed in carrying out those constant *changes* which we call vital processes, undergoing many and various chemical transformations, but passing through the body in a very short time in the performance of this function. Finally, the used nitrogen, both that wasted from the tissues and that used up in the vital processes, is excreted mainly in the form of urea. The far larger quantities of carbon and hydrogen are used up—burnt up in a sense—in doing work and producing warmth, using up oxygen in the process. The used carbon is partly excreted in the evacuations, but most of it in breathing and perspiration. The hydrogen nearly all passes off as water; and since water is not only taken in, but also formed in the body by hydrogen combining with oxygen derived from the food, more liquid is often excreted than is drunk. Most of the salts and sulphur taken in food, after doing their work in the complex vital processes, are excreted in the evacuations.

Constituents of Food and of the Body.

These facts bring us to the point we are directly and practically concerned with; viz. the *forms* in which the above elements exist, in the body to be fed and in the foods to be given it. Fortunately for us, both animals and foods, upon analysis, are found to consist of compounds which can be grouped into a small number of classes, which fulfil the different purposes above mentioned, and are found together in various degrees or proportions. These are classed as follow:—

1. The class containing nitrogen. These were once termed *proteids*, but are now usually called *albuminoids* or *albuminates*, since albumen (the white of an egg is nearly pure albumen mixed with much water) is the chief type of the class. There are certain vegetable principles which also contain nitrogen, in the form of ammonia (hence called *amides*), which some writers consider less nutritive, and class by themselves; but there is no general agreement upon this point, and we shall therefore follow most authorities in classing all nitrogenous compounds with the albuminoids. Fibrin in animals, gluten in grain, casein in milk, legumin in peas, belong to this group, almost any of which may more or less replace another,* and serve, if sufficient in proportion, as nitrogenous food. That is the great principle to bear in mind.

2. The next class consists of *fats and oils*, often called hydro-carbons, and specially rich in carbon. A certain portion of fat is necessary to the healthy body itself; so necessary, that unless sufficient be supplied, a certain portion even of the albuminoids will be decomposed in order to form fat. Hence, fat in due proportion is necessary to save or prevent such a wasteful use of albuminoids. Besides this, we readily see that this class finds its chief work in supplying fuel for heat and energy.

3. The next class, called *carbo-hydrates*, consists of carbon in less proportion than in fat, with hydrogen and oxygen in the proportions of water. Starch, sugar, and gum are leading compounds of this class in the vegetable world. This group has plainly more or less in common with the fats, and also supplies fuel for heat and energy; but it differs in not being directly represented, as the fat group is, in the animal body itself. Carbo-hydrates are, however, capable of being decomposed, and so forming fat in the body. Thus they also save waste of albuminoid foods; in other words, a due proportion of the carbon groups, as well as of the albuminous compounds, is necessary even for the increase of muscle or lean meat.

4. One component of vegetable foods especially requires separate mention. Cellulose, the material of which tough cell-walls and woody fibre are composed, is of nearly the same chemical composition as starch. Paper and cotton-wool are examples of cellulose. But this and kindred material exists in a form much more indigestible by most animals, and entirely so by some; hence, for our purposes, we take the harder of such constituents out of the carbo-hydrates, into a separate class distinguished as *husk* or *fibre*. A certain portion may be of value, as a mechanical stimulus to the intestines; but except for ruminant animals and birds, which digest part of them, they are of little value as food.

5. The last class is that of *salts and minerals*. Phosphorus and lime are needed for the bones; sulphur for the feathers, besides a little for the muscles; salt for the whole range of digestive processes; alkaline salts to alkalinate the blood, etc.

Besides the above, there is in all foods a very variable amount of hydrogen and oxygen in the proportions which form *water*, and may be classed as such, though the water—as in the case of apparently quite dry wheat or flour—assumes in some way a solid form, and may not be water at all.

Analysis and Nutritive Ratio.

It is on the basis of these classes of compounds that foods are analysed; and the great problem to be solved in feeding, or in a dietary, is of the very simplest kind, so far as theory goes. It is, to get *a proper proportion between the albuminoids and the heat-producing groups of fats and carbo-hydrates*. A dietary so arranged is called a properly "balanced" dietary; and if we give such a dietary, in proper quantity and in digestible forms, the animal will be properly fed. The actual proportion in any food, or any dietary, is called its "nutritive ratio." Thus a mixture of meals whose nutritive ratio is 1 : 6, means that the albuminoids in it are as one part by weight to six parts of fats and carbo-hydrates. But in calculating this ratio, one important modification always has to be made. Fats are much more fattening than starch or other carbo-hydrates, and are more efficient generally, because (as already noted) they are more rich in carbon. In adding up the two groups, therefore, we must multiply the figure for fats and oils by some figure; then we may add the product to the carbo-hydrates, and reckon the total as one, for the nutritive ratio.

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* It is not always fully the case, as is explained later on.

The precise figure has caused some discussion. At one time it was customary to multiply the fats by 2·44, which is the greater proportion of oxygen required for their combustion. Bauer showed that this was too great, and believed that in the animal body itself about 1·75 was the true value. The best authorities now consider that the correct figure is probably the equivalent of *heat* produced by the two groups. According to this, we must multiply by 2·25, or 2¼, and we may then add them to the carbo-hydrates, and shall get the true "nutritive ratio."

Digestibility.

Some authorities—chiefly chemists—introduced another complication into the calculation, under the title of *digestibility*. To quote a well-known writer*:—"The chemist first determines by analysis the percentage of each of the nutrients contained in the food. Weighed quantities of the feed are then given to some animal, and the solid excrement voided during the trial is saved, weighed, and samples of it analysed. Knowing how much of each nutrient was fed and how much of it reappears in the solid excrement, *the difference is held to be the portion digested, since it must have been retained in the body*." Many American poultry dietaries have been calculated upon this principle; the real analysis being revised by laborious calculation, and the figures reduced by what is termed a "digestive coefficient" obtained in this manner. But the whole is a mistake, based on ignorance of physiology. Its only basis is the fact that in the case of animals whose food largely consists of fibre and hard cellulose, by some of them scarcely any of this is digested, and it appears in the excrement in visible form, of which horse manure is a familiar example. Ruminants, which subject the fibre to long softening before rumination, digest a considerable portion even of such materials, and so do birds, which soften it in the crop and grind it in the gizzard. But in such a case as that of man, who rejects such material from his food before eating, the amount of solid excreta has *absolutely no relation whatever to indigestibility*. Any medical man knows of cases in which no evacuation may have taken place for a fortnight or more, though there has been fair activity, and a quite ordinary amount of food has been consumed; whilst in an ordinary case many pounds weight would have been excreted in the same time. The last case, and not the first, will be that of the best digestion; and the solid excreta, equally with the liquid, are in their nature not material which could not be digested, but *secretions* through which the body excludes its used-up products: the products of its vital processes, and of food which *has* been effectually digested, and done work in the manifold changes through which it has passed while within the system. We shall keep nearest to the truth so far as known at present, as well as simplify our work, by classing the crude fibre or husk by itself as more or less indigestible, and basing our dietary upon the rest, letting any nutrient there may be in the husk go in addition. It is also to be remembered that this component of poultry food is almost always more or less laxative in tendency.

On this basis, then, we deal with foods. The following table gives the principal materials available for poultry-feeding, roughly classified, and showing their composition as above described; and the amount of fats and oils is further shown as multiplied by 2¼, in order that this product may be used for calculating the nutritive ratio.

COMPOSITION OF FOODS.

Articles of Food.	Albuminoids or Flesh formers.	Fats or Oils.	Fats × 2¼ = value in Carbo hydrates.	Carbo-hydrates.	Salts and Minerals.	Husk or Fibre.	Water.
Grains and Meals.							
Linseed Cake	32·9	7·9 =	17·8	35·4	5·7	8·9	9·2
Beans and Peas	24·0	1·5 =	3·4	48·0	2·5	10·0	14·0
Malt Sprouts	23·2	1·7 =	3·8	48·5	5·7	10·7	10·2
Oatmeal	18·0	6·0 =	13·5	63·5	2·0	1·5	9·0
Middlings or Fine Sharps	16·0	4·0 =	9·0	57·0	4·5	4·5	14·0
Sunflower Seed	16·0	21·5 =	48·4	21·4	2·0	29·0	9·5
Bran	15·5	4·0 =	9·0	44·0	6·0	10·5	14·0
Oats and Ground Oats	15·0	5·5 =	12·4	48·0	2·5	19·0	10·0
Wheat	12·0	1·8 =	4·0	70·1	1·8	2·3	12·0
Barley (and Meal) ...	12·0	1·4 =	3·2	56·0	3·6	14·0	13·0
Millet Seed	11·3	4·0 =	9·0	60·0	3·0	9·4	12·3
Maize	10·5	8·0 =	18·0	66·5	1·5	2·5	11·0
Rye	10·5	1·8 =	4·0	72·5	1·9	1·7	11·6
Buckwheat	10·0	2·2 =	5·0	62·2	2·0	11·0	12·6
Hempseed	10·0	21·0 =	47·2	45·0	2·0	14·0	8·0
Dari	9·5	4·5 =	10·1	68·7	1·5	3·3	12·5
White Bread	8·8	1·8 =	4·0	50·4	0·5	0·0	32·5
Rice	6·0	0·4 =	0·9	80·0	0·0	0·0	13·0
Brewer's Grains... ...	5·4	1·6 =	3·6	12·5	1·0	3·8	75·7
Vegetables.							
Potatoes	6·5	0·0 =	0·0	41·0	2·0	0·0	50·5
Red Clover	5·0	0·8 =	1·8	13·3	2·4	0·5	72·0
Meadow Grass	3·5	1·0 =	2·2	13·5	2·0	4·7	75·3
Hay	8·4	2·6 =	5·8	41·0	6·2	27·2	14·6
Cabbage	2·4	0·4 =	0·9	3·8	1·4	1·5	90·5
Onions	1·5	0·2 =	0·5	4·8	0·5	2·0	91·0
Turnips	0·5	0·1 =	0·2	4·0	1·0	1·4	93·0
Animal Foods.							
Dry Meat Meal	71·2	13·7 =	30·8	0·3	4·1	0·0	10·7
Flesh of Fowls	21·0	3·8 =	8·5	0·0	1·2	0·0	74·0
Horse-flesh	21·7	2·6 =	5·8	0·0	1·4	0·0	74·3
Lean of Beef	20·5	3·5 =	7·9	0·0	1·0	0·0	74·4
Fresh-cut Bone	20·2	26·1 =	58·7	0·0	24·0	0·0	29·7
Dried Fish	48·4	11·6 =	26·1	0·0	29·2	0·0	10·8
Milk	4·0	3·5 =	7·9	4·8	0·7	0·0	87·0
Skim milk (separator)	3·1	0·3 =	0·7	5·3	0·7	0·0	90·6
Eggs (yolk only) ...	16·0	30·0 =	67·5	0·0	1·0	0·0	53·0
" (white only) ...	12·0	2·0 =	4·5	0·0	1·2	0·0	84·8

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* W. A. Henry, "Feeds and Feeding."

For convenience, in this table the grains and meals are placed in order of their nutritive values, or richness in albuminoids. The analyses are from various sources, many of them checked by more recent determinations. But no analyses can be taken rigidly, since a sample of white oats, 38 lbs. to the bushel, would differ appreciably from one weighing 42 lbs. Middlings or fine sharps are especially variable. The figures will, however, quite suffice as a fair average guide.

Proper Nutritive Ratio.

In using such a table to plan a dietary, we must first decide what proportions ought to exist between the various columns; and, above all, the proper "nutritive ratio" between the albuminoids, and the fats and carbo-hydrates added. We need not trouble ourselves much about the husk or the water, except so far as, being almost valueless, they affect the real cost of the food; and although we must see that there are salts enough, especially for young and growing stock, we can easily add them if required; so we mainly consider the nutritive ratio. On this point experiment has been chiefly confined to the human race and to cattle, the results very closely agreeing; and it is generally held that to maintain healthy animal life the proportion of albuminoids should not be less than 1 : 5. Some authorities, more specifically, consider there should be about albuminoids 18, fats and oils 7, carbo-hydrates 75, which works out the same ratio almost exactly, experts differing a little in detail. A similar ratio has been adopted for poultry, but before doing so, there are two points to consider.

The first is that of *exercise.* Cattle lead a very indolent life, as do the majority of men in less degree; and it is universally agreed that an active life requires rather more of albuminoids. Fowls are decidedly active animals. Still we shall certainly be safe in reckoning about 1 : 4½ as sufficient in genial weather, and keeping up the same total of albuminoids in winter, but increasing the carbo-hydrates, or still better the fats, to about 1 : 5, in order to meet the colder weather. Such summer and winter ratios should be amply sufficient, as regards the fowls alone.

But there is further to consider any daily *product* of the stock, such as milk or eggs. For any such, we must supply the material. This has been abundantly proved in the case of milking cows. Milk contains so much fat and sugar that its own ratio is 1 : 3 or 1 : 3½, hence additional food of the ordinary 1 : 5 ratio, with sufficient succulent material to supply fluid, may suffice fairly. Recent experiments have shown that the average dietary for milking cows in the United States varies from 1 : 7 in some States to as low as 1 : 10 in others, whereas it ought to be fully 1 : 5; and it has been proved by systematic tests, that when the ratio was raised even to that figure, the results were so improved that the butter cost three cents less per pound. In England a greater supply of albuminoids is given with yet further benefit, in the shape of linseed cake, etc. But eggs, we see above, contain about as much albuminoids as fat; and to produce an ounce daily (excluding water) of such rich material is no light task. Hence the need of special food for laying hens. Such a bird craves for albuminous food, and every breeder knows that while laying freely she will often devour with eagerness those giant earth-worms which, when not laying, she generally refuses. She *must* get albumen. Reserving this point for special consideration, however, and taking the above-named ratios as sufficient for ordinary purposes, including rearing, let us now put our table to use; and first of all examine a few of the principal ingredients commonly given as food to fowls.

Ingredients of Poultry Food.

Beans and Peas strike us at once by the very large proportion of albuminoids compared with the other groups; their ratio is as high as 1 : 2½. We see why the old cockers gave their birds peas while training, and why beans are given to horses when in severe work. The proportion is so large that it may be used to "balance" the dietary against other foods deficient in this group; but the deficiency in fats and carbo-hydrates is so great, that fowls fed largely on pulse would be hard, dry, and stringy. Pulse, even in moderate quantity, does not seem to suit some fowls, while others thrive on a portion of such diet; hence a dietary thus balanced should be watched with care. *Malt culms*, malt sprouts, or malt-dust, as variously called, are very similar in composition, but decidedly richer in fat, and moreover have most valuable digestive properties. This arises from their peculiar nitrogenous ferment, called diastase, which has the property of converting starch, and even a portion of cellulose, into the soluble substances dextrin and sugar, precisely the same changes that have to be produced in ordinary digestion by the saliva and pancreatic fluid. It is for the same reasons that finely ground malt is mixed with various kinds of "infants' food." When any form of such malted food is mixed with boiling milk or water, to the consistence of very thick arrowroot, after a few minutes the thick mixture becomes thin; the starch is converted by the malt principle into a soluble form, and dissolved. This simple experiment illustrates the effect of malt, or malt culms, in aiding digestion, and it has always surprised us that the Sussex fatteners have not taken advantage of it. Where obtainable, malt sprouts should always be purchased, and are far preferable in most cases to pea-meal, especially for young stock; but unfortunately they are a local brewing product, and only obtainable in some places.

Oatmeal stands out from the list as, by itself alone, an almost perfect food. Its own ratio is about 1 : 4⅓, and it has sufficient salts. We can see at once why the Scottish people fed upon it possess such tall and muscular frames, and why it rears such splendid cockerels. The same analysis applies to the hulled grain, "grits," or groats, given to chickens. Of all the foods, these two are the most valuable, taken by themselves alone. *Oats* mainly differ in the larger quantity of husk which they contain; but by fowls much of this is ground in the gizzard and digested, and when the whole grain is ground fine, as in Sussex, where husk and all is ground to a fine flour, this added cellulose makes "ground oats" also a nearly perfect food, as the results of it show. There is often difficulty in obtaining oats thus properly ground, as the stones have to be specially dressed, but it is to be hoped that increased demand by poultry-keepers will gradually spread the manufacture over the country.

Wheat is used in several forms. In the whole grain albuminoids are too low, below 1 in 6; but the greatest deficiency is in fat, whence the philosophy of bread and butter. Flour and white bread are worse, the albuminoids being less than 1 in 8; hence, a sandwich is plainly a scientific combination. *Bran*, as we should therefore expect, is much richer in albuminoids, and also in fats; here again, therefore, we have a corrective which may be very useful, only we must bear in mind that it is not all digested, and that the husky matter sometimes sets up intestinal irritation if long continued. Still, it is often a very useful albuminoid. There remains *middlings* or *fine sharps*, of which the better quality equals oatmeal as an albuminoid, and is cheap and valuable food; but the quality and nomenclature differ very greatly. Some middlings are little better than fine bran; the best consists of fine sharps with some amount of the coarser parts of flour. This is in some places called "pollard"; but in other places the same word "pollard" denotes mere bran even coarser than usual. It is much to be wished that these bye-products of wheat were more uniformly and exactly defined.

Of the other commerce grains, *buckwheat* is inferior to wheat, its ratio being about 1 : 6½, but being more rich in fat; hence we see why it fattens fowls so well in France. The analysis, however, only refers to the new, "full," grey coloured grain, which mostly comes from France, and is alone worth purchase. Much that is offered is light in weight and brown in colour; such is kiln-dried, and of little food value. The difference accounts for the refusal to eat this grain which some correspondents report. *Barley* has more husk, and is most deficient in fat of all the grains; and unfortunately it is just the poorest and most husky samples that are ground into meal. *Rye* has less husk and more starch, but is otherwise of similarly "dry" character, and a poor food; its ratio is only about 1 : 7½. *Maize* appears above as the most oily (excluding "seeds") of all common grains; but this has been disputed, Bauer giving an analysis by which the fat in maize is reduced to 5, and that in oats raised above 6, making oats the most oily of the cereals. That oats are rich in fat is shown above, and by the rancid smell and taste of stale oatmeal. It appears that in certain localities this fat is increased; while, on the other hand, the fat in various American maize analyses has varied from 4·8 to as high as 8·3. On the whole evidence we could collect, therefore (in which the notorious and special tendency of maize to deposit yellow fat must be included), we have taken the figures above as at least the safest, for the samples which generally reach this country. The ratio comes out 1 : 8, albuminoids being also too low, and starch too high. *Dari* is a little better, with less fat; and at the bottom of the list comes *rice*, little better than dry starch, and practically destitute of fat altogether. Allowing for the large quantity of water, *potatoes* stand in somewhat the same position, but with a much better, though still low ratio of 1 : 6½.

Some other ingredients claim attention for various reasons. The extraordinary quantity of oil in *hempseed* will be practically familiar to all already, while its ratio is only 1 : 9. What our table does is to bring out the far superior value, as food for poultry, of *sunflower-seed*. This is shown to be equally rich in fat, but far superior in albuminoids, and with less starch, so that it comes out on the whole as 1 : 4½. Experience fully bears this out, stamping it as a most valuable food, and which, growing freely in many localities, and the plants giving shelter meanwhile, is well worth the attention of many poultry-breeders. The real food value of *grass* and *hay* will not fail to be noticed; and above all the very high value of *clover*. This, too, has long been discovered and acted upon by the egg-farmers of

America, who "feed" clover regularly; though we fear it is not fully appreciated in Great Britain. At all events, the albuminoid ratio comes out as high as 1 : 3, with salts also in high proportion.

Among the animal products, the close resemblance in the composition of all lean meat will be noticed, indicating that any animal food may be used as economy dictates, unless the subject of disease. Especially will be seen the high food value of *fresh bone*, which is greedily eaten when cut small. Raw bones as obtainable from the butcher's are here understood, but bones from joints only roasted or boiled, and not stewed for soup, are almost as good. Cut bone is nearly as rich in nitrogen as flesh, and far richer in fats and earthy salts. Its use, along with clover, is chiefly relied upon in America for securing profuse egg-production, even with such a grain diet as maize. The high value of *dried fish* as an albuminoid corrective and source of mineral salts will also be seen, and accounts for the popularity of many foods containing a large proportion of fish-meal.

A glance over the table has thus shown us generally the dangers attending hempseed, or even maize, and the great deficiency in nutriment of any diet in which bread, or rice, or potatoes play a disproportionate part. Before drawing such conclusions we must however remember that, provided fowls have free range, such deficiencies may be made up by insects and other animal food. In such circumstances, no doubt it very often is so, including even the nitrogenous supply for egg-production; and hence it is that maize is so largely used in America without injury. Nature herself, guided by natural appetite or craving, will largely "balance" such a dietary, and any of the ordinary cereals may probably supply adequate food when thus supplemented. It is in more or less confinement, where the fowls are really dependent upon what we give them, that such facts become important. We have therefore, finally, to learn how our table enables us to *construct a dietary* which shall be properly "balanced" or proportioned.

Balancing a Dietary.

It is evident that we can do so from very various materials; and that therefore in selecting these we may study the market, as regards cost of the total; and we can also give variety, which is in itself desirable for health and appetite. Generally speaking, again, only one kind of grain will be given at a time, and mostly at the evening meal; as a rule, therefore, we choose some one grain for that meal, and "balance" this by our soft food for the morning. The total food-value of a week's diet, or ration for one day if preferred, is found in the simplest way, by adding together the figures for each ingredient as above, divided or multiplied so as to give their relative *proportion* as mixed in the dietary. Thus, if we mix 2 lbs. or 2 stones of one ingredient to 1 lb. or 1 stone of others, we must multiply by two the figures for that ingredient, to get the true proportion. In adding the fats and oils, it must not be forgotten to take, not the figure of the analysis, but that figure multiplied by 2½, as given in the right hand of the column.

We will take first a diet in which the evening feed consists of maize, reckoning (as in other cases) that an equal weight of meals (weighed dry, before scalding) is given in the morning. We know that we must "balance" the maize by food containing more albuminoids. Let us try a mash composed of half malt sprouts and half middlings. To avoid fractions we will here take 2 lbs. maize and 1 lb. each of the middlings and malt dust. It works out thus:—

(1)	Albuminoids.	Fat × 2½.	Carbo-hydrates.	Salts.
2 lbs. Maize (× 2) ...	21·0	36·0	133·0	3·0
1 lb. Middlings	16·0	9·0	57·0	4·5
1 lb. Malt Sprouts ...	23·2	3·8	48·5	5·7
	60·2	48·8	238·5 +48·8 287·3	13·2

This is not a bad dietary, except that most of the albuminoids are confined to the mash. The fat proportion is good, and the nutritive ratio works out as 60·2 : 287·3, or a little under 1 : 4½. We can bring it up to that by a little more malt dust, or pea-meal, the ratio of which is nearly the same, and we thus see that maize may be used in moderation when so "balanced." We say "in moderation," because there is no doubt that, beyond its analysis, there is something in the composition of maize which tends *specially* to fat, and above all to internal fat, which is worst of all. Again, let us suppose that ground oats and horseflesh are available; one part minced flesh to two parts ground oats will make things nearly right. Here we must take three parts of maize to equalise the mixture, and it works out thus:—

(2)	Albuminoids.	Fat × 2½.	Carbo-hydrates.	Salts.
3 lbs. Maize (× 3) ...	31·5	54·0	199·5	4·5
1 lb. Horse-flesh ...	21·7	5·8	0·0	1·0
2 lbs. Ground Oats (× 2)	30·0	24·8	96·0	5·0
	83·2	84·6	295·5 +84·6 380·1	10·5

Here the nutritive ratio is 83·2 : 380·1, or slightly under 1 : 4½, which a little more flesh will bring as high as desired. Both these mashes are, however, excessively nitrogenous, and it would be better to use maize in the form of meal, "balanced" as in Table I. above, for the breakfast; when good heavy white oats given as grain at night would well keep up the total ratio.

Potatoes in Dietary.

Potatoes and bread are dangerous foods as commonly used, but are often very cheap, and can be dealt with upon the same principle. Let us see what we can do with potatoes, taking oats for the evening feed in order to lessen the difficulty of the balance :—

(3)	Albuminoids.	Fat × 2¼.	Carbo-hydrates.	Salts.
2 lbs. Potatoes	13·0	0·0	82·0	4·0
¾ lb. Malt Sprouts ...	17·4	2·8	36·4	4·3
2 lbs. Oats	30·0	24·8	96·0	5·0
	60·4	27·6	214·4 +27·6	13·3
			242·0	

Here, the potatoes being watery, the 2¾ lbs. of mash are not more than sufficient against 2 lbs. of dry oats. We find we have brought the ratio (60 : 242) up to 1 : 4, so that less malt dust would suffice, or the little more would quite balance a less rich grain than oats, such as buckwheat or wheat. Pea-meal would have the same effect; but with potatoes, above almost any food, the digestive qualities of malt dust make it much the best corrective where possible. The above is still rather deficient in fat, which can be easily supplied by a little animal fat, or a little ground oil-cake, or oily seeds.

Or let us examine by itself the very common mash of potatoes and bran, taking equal parts :—

(4)	Albuminoids.	Fat × 2¼.	Carbo-hydrates.	Salts.
1 lb. Potatoes	6·5	0·0	41·0	2·0
1 lb. Bran	15·5	9·0	44·0	6·0
	22·0	9·0	85·0 +9·0	8·0
			94·0	

The ratio here is high, 1 : 4½, and will answer with any grain not very inferior at night. The deficiency is in fat, and we must also keep watch against any signs of chronic intestinal irritation. If we can add a little fat the one fault will be remedied; and if we can add even a little malt sprouts, the digestibility of the bran will be much improved, and a really good mash produced. Another common mash is composed of sharps and barley-meal; we will test this :—

(5)	Albuminoids.	Fat × 2¼	Carbo-hydrates.	Salts.
1 lb. Sharps	16·0	9·0	57·0	4·5
1 lb. Barley-meal ...	12·0	3·2	56·0	3·6
	28·0	12·2	113·0 +12·2	8·1
			125·2	

The ratio here is 1 : 4½, which is good, and the chief deficiency is in fat, which is easily supplied.

Yet again, in America a mash of two parts of bran to one of maize-meal is in practice very common for chicks in brooder-houses.

(6)	Albuminoids.	Fat × 2¼.	Carbo-hydrates.	Salts.
1 lb. Maize	10·5	18·0	66·5	1·5
2 lbs. Bran	31·0	18·0	88·0	12·0
	41·5	36·0	154·5 +36·0	13·5
			190·5	

This gives a ratio of nearly 1 : 4½, quite vindicating practice by science. The mash is usually supplemented by a little animal food.

Grain alone as Diet.

In the case of fowls kept on good grass runs, it is often a great saving of labour to give a diet of grain alone, and they will do well upon it when thus circumstanced, if the grain is properly chosen. Good white oats should form one of the components, for the sake of the albuminoids and fat. Let us take :

(7)	Albuminoids.	Fat × 2¼.	Carbo hydrates.	Salts.
1 lb. Heavy Oats ...	15·0	12·4	48·0	2·5
1 lb. Buckwheat ...	10·0	5·0	62·2	2·0
	25·0	17·4	110·2 +17·4	4·5
			127·6	

This ratio (25 : 127) is pretty good, very nearly 1 : 5, and contains a fair amount of fat. The next best grains are barley and wheat, both of which are poor in fats and oils. Here, perhaps, the best of all dry correctives, if obtainable, would be sunflower-seed, whose food-value comes out especially in such a case as this; it is so rich in fats, and at the same time in albuminoids, that, where it is obtainable, a small quantity will fully correct even such dry grains as wheat and barley. If one entire feed could be given of it, it would nearly balance even such inferior grain as rye; but it is too expensive for a whole feed, or to be used very largely in this form.

We need not give further tables for our purpose, which is not to give a number of definite dietaries, but rather to show *how a proper dietary is constructed.* We have used as albuminoid correctives pea-meal or malt culms, horse-flesh, bran, and rich seed; and have dealt in turn with such starchy foods as maize, potatoes, and rye; such examples will amply answer all purposes of illustration.

Green Food: Clover.

Green food has not been taken into account in the above. Grass or hay have themselves a ratio of about 1 : 6 and 1 : 5½; and eaten as supplementary to solid food, this need not trouble us. Cabbage has a high ratio, but is seldom given in proportion enough for its really solid components to disturb matters appreciably. Clover may be mentioned as exceptional. With an actual albuminoid component nearly equal to dry rice, its own ratio is so high as 1 : 3. Hence it is of actual value as an albuminoid corrective, and in America is given largely as such to the laying stock; even in winter clover hay being cut and steeped in hot water over night, to mix with the mash breakfast of the laying stock in the morning. Dried clover is also ground into meal, to be mixed in the same way.

Special Dietaries.

This brings us finally to two questions, the first of which is whether the ratio of albuminoids we have been considering, is really sufficient for all purposes. To maintain the health and condition of the fowl, as a fowl, we may be sure that it is. But there are three exceptional conditions also to be considered, and the question arises, what special allowance these may require, and how such are to be dealt with.

(*a*) Let us consider the young and growing bird. Here we have, besides maintenance and work in exercise, to *make tissue* at a great rate. It would certainly seem that, for the best results so far as mere growth is concerned, more albuminoids must be required, as the ratio of milk itself, and the composition of the egg itself, plainly teach us. All experience proves that this is so. We give this in the shape of skim milk, or meat, or cut bone, or malt dust, or pea-meal if the birds will eat it; but pea-meal seems to suit them less than the others. In this way we easily enrich our other food to the needs of a *growing* dietary.

(*b*) Or we have to fatten and prepare birds for the table. Here also practical experience vindicates theory, as any true theory always will be vindicated. The Sussex fatter takes as his basis the ground oats, which, as we have seen, themselves give rather a high ratio, but adds thereto skim milk, and suet or some other form of fat. The skim milk gives him albumen in the higher ratio of 1 : 2, in the most easily digested form of all; and the fat similarly assists in what he desires. This dietary also, then, differs from the normal ratio, exactly as we should expect.

Diet for Laying Hens.

(*c*) Thirdly, we have to consider *laying* hens. A little consideration must show us that for birds in active laying, a 1 : 5 ratio cannot be sufficient. In a fair-sized egg, we have two ounces daily to be produced, in addition to the hen's own needs for life and health. Of this more than half is water; but, there being waste in vital processes, we ought to reckon that an ounce in solids is the daily requirement, and this is nearly all composed of mineral salts, albuminoids, and fat. This supply, in some cases, the fowl may be able to pick up herself, and we have already commented upon the craving for immense worms, otherwise refused; thus Nature herself teaches us that *animal food* is the best means of supplying the need. Where there is not wide range we must supply this; and since meat is itself three-fourths water, it follows that a layer only given bare living ration, "balanced" as above, should have *nearly two ounces daily* of cut bone or fairly fat meat, to maintain a constant egg-supply. Cut bone is in many respects best, as supplying much more of both fat and earthy salts for the shell, in proportion.

Such a proportion will seem large, and the conclusion startling; but it is supported by facts. There are, however, heavy qualifications to be made. Every fowl is given much more than a mere subsistence ration of ordinary "balanced" diet; then the albumen and fat of the surplus will go to eggs, and even part of the carbohydrates will be decomposed to form fatty egg-material; and so a fair egg supply may be maintained. The necessary extra supply of albuminoids for a more constant production will thus be reduced by a great deal, perhaps by half, less or more. But the extra supply, be it what it may, must be supplied if we are to have the extra result. Americans have for years been far beyond us in this matter of egg-production. Many of them, while we have been talking about it, have *actually attained* egg-averages ranging from 170 to as high as 190 per annum from considerable flocks, and still more from small numbers. These farmers have proved by experience that such an egg-yield as this, while it has to be "bred" for in the first place, must also be "fed" for if it is to be realised; and in their practice they do feed for it, by the copious supply of fresh cut bone, and clover or clover-hay, especially in winter when insect food fails. Doubtless, such production and feeding is not exactly normal health, but over-stimulation of a decided character; the hen is regarded purely as an egg manufactory. If however this is so and she is to produce the eggs, such are the conditions.

Forcing Diet not always Advantageous.

On the other hand, a fowl not "bred" to produce the eggs could not utilise such forcing diet to advantage; or if any other circumstances prevented response, such a diet might do harm rather than good. This might easily occur in several ways. All the organs might be more or less over-stimulated and hypertrophied; or the bird might lay on flesh and fat; or she might suffer from enlarged liver and become torpid, laying even fewer eggs than before the forcing diet was given. We have an impressive example of this in two bulletins from the Massachusetts Agricultural College, at Amherst in that State, reporting two years' experiments in feeding two similar lots of hens upon a comparatively narrow nutritive ration (1 : 4·20), and a wider one (1 : 6·30), obtained mainly by substituting large quantities of maize for the wheat, oats, etc., used in the other. The first experiments were noted separately in winter and summer periods, reckoned from December 12th to April 30th, and May 1st to October 4th. In the next experiments, two lots, one of barred Rocks and the other of white Wyandottes, were fed on each ration, the periods being October 25th to April 27th, and May 1st to September 27th. Each lot consisted of twenty hens, confined in similar quarters, comprising a house 10 × 12 feet, scratching-shed 10 × 8 feet, and open yard 24 × 50 feet, without grass, to which they had access in good weather. The following are the results of the second year's winter experiments:—

Winter Experiment—183 *days.*

	WYANDOTTES.		PLYMOUTH ROCKS.	
	Narrow Ration.	Wide Ration.	Narrow Ration.	Wide Ration.
Number of hen days, not including males ...	3,560	3,560	3,424	3,554
Cost of food	$9·26	$7·30	$9·25	$7·68
Cost per egg (cents) ...	1·50	·90	2·41	1·02
Eggs per hen day * ...	·17	·24	·11	·21
Weight per egg (oz.) ...	1·91	1·82	1·76	2·09
Total weight of eggs (lbs.)	72·90	95·90	48·24	98·62
Dry food per egg (lb.) ...	·99	·75	1·57	·88

The same test gave in summer similar results relatively, though of course the total numbers of eggs laid were considerably greater:—

Summer Experiment—140 *days.*

	WYANDOTTES.		PLYMOUTH ROCKS.	
	Narrow Ration.	Wide Ration.	Narrow Ration.	Wide Ration.
Number of hen days, not including males ...	2,945	2,913	2,400	2,555
Cost of food	$7·50	$5·86	$6·14	$4·91
Cost per egg (cents) ...	1·03	·64	1·00	·60
Eggs per hen day ...	·25	·31	·26	·32
Weight per egg (oz.) ...	1·88	1·90	1·82	1·77
Total weight of eggs (lbs.)	85·89	108·70	70·40	89·94
Dry food per egg (lb.) ...	·70	·58	·67	·55

From these experiments and results the following conclusions were drawn: (1) That the wide maize ration appears much superior to the other as regards number of eggs laid; in the Wyandottes, by 41 per cent. in winter and 24 per cent. in summer; in the Rocks, by 91 per cent. in winter and 23 per cent. in summer. (2) That the cost of food was much less, and the cost per egg. (3) And that the maize-fed fowls gained also more in weight. These results and conclusions were by many American poultry-keepers considered to prove that after all urged to the contrary, maize is superior to wheat as food for laying hens; and the same conclusions, curiously enough, were accepted without criticism by numerous poultry-rearers in our own country.

Such a conclusion is illusory, and the whole is an example of the loose and ill-considered character of what often passes for "experimental investigation." In this case, to begin with, any practical poultry-keeper would call the rations given, poor rations. The narrow one was partly made up of a certain residue called "gluten feed," which, we have been personally informed, hens will only eat when it is disguised in other food; and the green food was quite insufficient to promote vital activity, or "metabolism," consisting in summer only of lawn clippings three times a week. So limited a supply of one of the most important constituents of poultry diet could not possibly maintain the vital functions in healthy action; or enable them to utilise the rest of the dietary to advantage. In the second place, the figure work of the first year's experiments appears carelessly done. The eggs per hen in 297 days are stated as 105 for the narrow and 128 for the wide ration; while we can only make it (on the details given) 90 and 114; and where the calculation is given as 0·36 egg per hen day, we only make it 0·29. On this account we have taken above the second year's experiment, where the figures do appear to tally with the facts and details stated, and are accordingly lower. Thirdly, the results from both rations are wretchedly poor. Whether it is the fault of bad management, or unsuitable food (including want of green food), or of the fowls being bad layers, the egg-results are almost beneath contempt. The highest summer return (0·32) is less than 120 per annum if all the year were summer; the lowest (0·11) is only 40 per annum if all were winter. The alleged enormous superiority of 91 per cent. in maize for Plymouth Rocks for winter, means a difference between about 20 and 38 eggs per hen in six months! As a test of results in promoting egg-laying between maize and wheat, or narrow and wide nutritive ratios, such figures are farcical. Either these eighty hens could not lay well anyhow, in which case the real conclusion is, as above stated, that a forcing diet is not only useless, but injurious to such as cannot respond to it; or else all alike were *prevented* laying by some bad management, quite apart from maize and wheat. Such ridiculously low figures as these in no way upset the theory and practice of numerous skilled American egg-farmers, who do get from 150 to nearly 200 eggs per annum from a high nutritive ratio, compounded with adequate proportions of cut clover (properly prepared), and cut bone or meat-meal. The recorded cost per egg (in food alone) points the same moral in another way.

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* A hen day means one day of one hen. Thus 0·24 of an egg per hen day means that less than a quarter of an egg was laid per day, or that there was one egg in rather more than four days, while 0·11 means that nearly ten days were required for one egg on an average.

Substitution of Albuminoids.

We described the rations given in this "experiment" as poor, and this leads to a further question, above hinted at—whether it really is indifferent *how* a given nutritive ratio is attained, so long as it is made up. Are the albuminoids in pulse, for instance, really able to take the place of animal food in all respects? Broadly and roughly, experience shows that they are; if it were not so, our dietaries are worth nothing; but is it so altogether? On this point some interesting and valuable experiments were made at the New York Experimental Station at Geneva, during the same periods.[*] Two lots of chicks were fed from half-week to twenty-five weeks old, and two others for fourteen weeks after six weeks old, upon foods compounded so as to have a similar nutritive ratio, but one feed all grain, while in the other the albuminoids were largely supplied from animal sources, such as meat-meal, dried blood, and cut bone. Both feeds, however, contained some skim-milk. Much more food was eaten per day by the lot receiving animal food; but the gain in weight was so much more rapid, and maturity was reached so much earlier, that less food was required per pound, and each pound gained only cost 4¼ cents as against 5⅙ cents. Those with animal food reached 2 lbs. five weeks before the others, and 3 lbs. eight weeks sooner. With the chicks started at six weeks, the differences were similar, but less marked. Lots of cockerels were also similarly fed from three months old, and for eight weeks there were similar differences; after that the birds did not make paying progress on either food. The most startling difference was, however, in ducklings. The "animal-food" lot developed rapidly and were healthy; the grain-fed ones were stunted, pitifully thin, and after fifteen weeks only twenty out of thirty-three were alive. These were then given the other ration for four weeks, and made rapid gain, but never overtook the others. Similar advantages were obtained in the case of laying hens.

Here would appear conclusive proof that the albuminoids in grain alone can *not* altogether replace animal food. But those who conducted this experiment found that they had not yet considered all the factors concerned.[*] The ingredients in the foods which went into the "ratio" had been made equal; the birds were alike, and placed under the same conditions. But study of the analyses showed that the two diets did differ in one other respect not reckoned in the ratio. Owing largely to the fact that one of them consisted largely of maize, whose deficiency in albuminoids was corrected by gluten feed, while the other contained a considerable proportion of dried meat-meal, the animal-food mixture contained considerable more of ash, or *mineral salts*. A second series of experiments was therefore commenced, in which two mixtures were used as before, of similar ratio, but one containing animal food. But to the grain-only mixture was now added the ash from bones, burnt so as to get rid of all organic matter, in proportion sufficient to make the mineral ash fully equal. The results were remarkable. Upon the grain ration thus supplemented by mineral ash, the chicks now did as well as upon animal food. Laying hens also did as well for most of the time they were tested (thirty weeks), but towards the end showed a slight gain from the animal food; and as their laying was not remarkable in either case, it seems to us probable that with prolific layers this difference would have remained more prominent. With ducklings, the addition of the bone-ash made the results "much better," but the animal-food ration was still much the best.

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[*] See Bulletins Nos. 149 and 171, by F. H. Hall and W. P. Wheeler.

[*] It is from want of *considering all the factors* that the other experiment above quoted (only here quoted in the hope of counteracting in some degree the mischief which we know it to have done) has been interpreted as leading to such results as were stated. Of course, facts are always useful if correctly recorded. But the truth of any conclusions drawn depends upon the question, whether *all* the facts have been duly taken account of.

In these experiments 1,000 chickens and 170 ducklings were fed to marketable size, and 90 laying hens and 40 cockerels were fed for lengthy periods, "so that the evidence has the weight of time and numbers." The results are of great interest and importance. They show that if *all* ingredients are supplied, we may in the main depend upon "substitutions" in our dietaries; though in regard to eggs, and still more in regard to ducklings, there is *something* in animal food which nothing else can quite supply. And they demonstrate incidentally the reason for the marked effect of bone-meal in rearing chickens. But their chief lesson is the proof they afford of the necessary place of an adequate supply of salts, or mineral matter, in a complete dietary. That such was necessary to constitution has long been known, and for complaints like "rickets" the administration of phosphates has long been recognised. But an impression has undoubtedly existed that such ingredients had to do mainly with the strength of the bony skeleton of the animal; whereas these experiments show that even for growth generally, or for egg-production, an adequate supply of mineral salts is essential to a good dietary, and must be artificially made up where deficient, and especially where grain food only is used.

Quantity of Food.

It will need no direct proof, that any fixed quantity of food must be a mistake. If we give at all times, to all fowls, the food needed by an incessant layer, we are forcing the system in a way that must cause ill results; even the layer will be probably "worn out" earlier, and should be killed in good time. On the other hand, if we only give "living" diet to laying hens, they *cannot* lay many eggs. If a hen has no more than this, she has nothing for eggs, and can only produce a few, at the cost of becoming a skeleton. Of course no fowls are ever fed so scantily as this; all receive considerably more than a mere subsistence dietary, and hence are able to supply us with some eggs, it may be a very fair supply in comparison with what Nature has intended. But if we want her to lay copiously and for long periods, we must give her still more; in proportion, however, to what she is inherently capable of *turning into eggs.* Hence we need to sort out fowls into ages and laying qualities, and even feed the same birds differently when in full lay, from what we do when resting. It is all the simplest common-sense reduced to figures, and quite easy to understand, but it requires constant watchfulness and care.

On the whole, therefore, it appears that the best general method will be to plan a main standard dietary in various judicious ways (for prices must be studied, and mere change of itself is greatly in favour of health and appetite) according to a normally balanced ratio of 1 : 4½ or 1 : 5, and *adding* to it in confinement a little animal food for all fowls, but especially providing, by that means or other nitrogenous food, and fat, the special requirements of growing, or fattening, or laying stock. As the requirements of rapidly growing and of laying stock are very similar, any difficulty in accomplishing this is much diminished. But a constant watch must be kept upon the egg supply, the demeanour of the fowls when feeding, and their apparent condition. Out of a flock forced for laying, there is always liable to be a portion which, perhaps only temporarily, divert the high diet into injurious channels, and should be withdrawn from it till able to respond in the required direction. The more forcing and nitrogenous the diet, the more carefully must quantity be watched, and as a rule somewhat decreased; the more plentiful and constant must be the green food; and the more constant the vigilance exercised over the whole. And during moult, or any other period of prolonged rest, a forcing laying diet should obviously be somewhat modified. It is always to be remembered that when such diet is not being *actually converted* into the eggs or the flesh desired, it must have some other effect, which will probably be injurious.

CHAPTER III.

PRACTICAL MANAGEMENT AND FEEDING OF FOWLS.

SUCCESS in poultry-keeping, on the smallest scale or the largest alike, requires sufficient *interested* attention from someone qualified to give it. We have found uniformly during many years, that with the rare exceptions where they themselves can be brought to take, or naturally take, a strong interest in the matter—such exceptions being worth their weight in gold—servants or labourers cannot be relied upon for long together to mix food properly, to give it carefully, to keep things clean, to work steadily, or to see to many other matters essential to economy or well-being. If there are children in a family old enough to undertake a small stock, they will be alike benefited and pleased by looking after the fowls, and soon grasp the proper ways of doing it. If not, or on a larger scale, the owner must either see to things personally, or take such oversight as shall persistently *secure* proper economy of labour, and care of his birds and of their feeding. If this cannot be done, it will be best not to attempt keeping fowls; even a few, without such care, would probably become a nuisance and prove a loss.

A System of Management.

Whatever be the scale of operations, again, some general system of management should be pursued; and it is obvious that such a system must differ, as will somewhat the kinds or breeds of fowls selected, according to the extent of the accommodation, and the objects desired. Let us take again the very smallest scale; supposing that some supply of eggs for household use is the end in view, and that a small house and run as described in Chapter I. are all that can be given up to the fowls. In such circumstances exhibition is quite out of reach, and even chicken-rearing is practically impossible, unless it can be carried on in some run and place of shelter quite independent of the other; and yet a few fowls can be kept so as to be a source of continual interest, and yield a good return upon their cost.

The proper plan in such a case will be to purchase in the spring a number of hens proportioned to the size of the run, and none exceeding a year old. A cock is useless, as hens lay very nearly, if not quite, as well without one. These birds, if in good health and condition, will either be already laying, or will commence almost immediately; and if properly managed will ensure a constant supply of eggs until the autumnal moulting season.* Whenever a hen shows any desire to sit, the propensity must be checked as hereafter described. But it is much better to avoid all this by keeping only a non-sitting breed, such as one of the Minorca, Leghorn, Hamburgh, or French varieties. Hamburghs are not suitable for a confined shed alone.

Good Layers.

To buy only young and healthy birds is very important. An experienced hand can tell an old fowl at a glance, but it is rather difficult to impart this knowledge to a beginner, for no one sign is infallible. In general, however, it may be said that the legs of the young hen look delicate and smooth, her comb and wattles soft and fresh, and her general outline, even in good condition (unless fattened for the table), rather light and graceful; whilst an old one will have rather hard horny-looking shanks, her comb and wattles look somewhat harder, drier, and more "scurfy," and her figure is well filled out. Attempt should also be made to secure birds of a really good laying family or strain, for each breed differs much in individuals. Good laying is now bred for practically as much as fancy points, and such birds, or eggs from them, are widely advertised in the principal poultry papers. Perhaps their price may be an objection for a small family stock, however; and to a large extent good layers can be selected even by "eye," from fine common country fowls. They should have good sized combs, but not too large, very fresh and red-looking faces, and a neat, alert, intelligent expression. A faded, dispirited look in a young bird is a sure sign of a poor layer. Beyond this it is not possible to go, and pictures pretending to represent "good layers" and "bad layers," by dealers who make pretence of knowing more than anybody else, only produce in the experienced breeder a smile of derision.

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* It is really as well, and often better, to start about October with April pullets. Our reason for not recommending this so much to the absolute beginner, is that he may get into the habit of attending to the fowls before the winter comes on, when it might be felt more of a tax if then confronted for the first time. Also eggs will come sooner, and a little "hen-fruit" is a great encouragement.

Directly these hens stop laying in the autumn, and before they have lost condition by moulting, they should, unless they have proved unusually satisfactory, be either killed or sold off, and replaced by pullets hatched in March or April, which will have feathered early. These again, still supposing proper food and good housing, will begin producing eggs by November at farthest, and continue, more or less, till the February or March following. They will not stop laying long, and the young birds should be retained till the autumn, when all but very excellent layers must be got rid of; such are worth keeping for another year. But if a few fowls only be kept for eggs, it is essential to success that every autumn the stock be thus replenished with pullets hatched early in the spring. By no other means can eggs at this season be relied upon.

When chickens can be reared there is a wider choice of breeds, including such as lay the coveted brown egg. Of these may be mentioned Plymouth Rocks, Brahmas, Langshans, Orpingtons, Wyandottes, and others; but the qualities of various breeds are more fully dealt with in later chapters. We prefer pure breeds, or first crosses; but the cost of such may stand in the way with some, and has to be taken into consideration. Pure stock has now become so widely distributed that the common fowls of the country are often nearly pure or cross-bred, and almost always enormously improved compared with what we remember in our youth; and so far as profitable domestic results go, success may be attained with good ordinary or "barn-door" fowls. Care must be taken in the selection. They should be young, sprightly-looking birds, and for laying, with nice *tight-looking* plumage. They ought to be chosen from a country yard where their parents have been well fed. If such be obtained, they will repay the purchaser, and are better than weedy and debilitated birds of the "fancy" class. Of course this last remark does not apply to mere faults of colour. Fowls are often to be met with at a moderate price, which from some irregularity are quite disqualified as show birds, but which possess all the economic merits of the breed to which they belong. And those merits are very real, in spite of all the railing against exhibition poultry on the part of some who ought to know better. After all is said, it is still the "fancier" who gets eggs, when other people get none! But the little we wish to say on that subject belongs to a subsequent chapter; we are only here pointing out that for eggs or table fowls only, good cross-bred fowls are to be found which will answer every purpose, and that such a supply is mainly due to the work during long years of the much-abused "fancier."

Date of Birth and Laying.

In regard to chickens reared at home, the same care must be given to the time of hatching, if the best results are to be obtained. It has been often said that a pullet must begin to lay at a given age; but this we have found, by systematic experiments, is by no means the case, a difference of months being caused by the time of hatching. If the age of five months finds a pullet belonging to one of the specifically "laying" breeds in the midst of warm weather—say August—eggs may be expected about that time; indeed, great care is needed if it is desired to *prevent* laying at such an age. But birds hatched in May will complete their sixth month in October; and in some cases eggs will not then be procured before Christmas, if even then, unless the feeding be most carefully adjusted. Still later hatched—let us suppose June—it will be next spring before many of the pullets are producing eggs, and ere this occurs some of them will be at least nine months old. Ordinary fowls become broody oftener in May and June than any other months, and the bright warm days tempt the proprietor to choose that time for hatching the chickens. The latter do well; they enjoy themselves, and thrive, and grow; but they do not *pay;* whereas chickens hatched from the middle to the end of March, or in April, will require more attention certainly, and call for self-denial occasionally, in the shape of braving bad weather to see they are duly cared for; but will often, if in reach of a town market, repay the whole of their cost before New Year. Pullets hatched early will moult early also, not only getting better and more quickly through the process, and having warmer weather for it, but getting ready to commence laying in good time again.

Too early hatching, on the other hand, should be avoided; that is, for ordinary domestic purposes. The last half of March and first half of April is about the best general time, though up to the end of April, or with some breeds early May, is not too late. So very early as many exhibitors hatch—in January and February—leads to quite different results; as such birds often lay in the late summer and early autumn, and then moult like adult fowls, stopping afterwards for several months. This extra-early season for first laying is of use where large numbers of laying hens are kept to supply the market, as they keep up the *succession* of eggs, which are scarcest of all in the autumn. But for a small number, our rule will be the sound one. One third the stock in late summer should consist of pullets hatched the March or April previous; another third of hens a year older; another third of hens to be killed or sold as soon as they stop at moult. The old hens are thus regularly replaced by pullets six months old, which begin to lay almost at once, and are followed in laying by the hens as they finish moulting. Even if only half a dozen fowls are kept for laying, this is the plan to be followed; each autumn the three oldest should be killed or sold, and three pullets bought. With fairly good layers there will then be a nearly constant supply of eggs.*

Quantity of Food.

We have next to consider the practical feeding of our fowls, on the principles explained in the preceding chapter. In regard to quantity little need be added. It has already been shown why any fixed quantity must be more or less injurious; we do not even know very definitely what is the bare necessary "subsistence" quantity for a fowl. German experiments place it, for cattle, at about one-fiftieth part of the animal's weight, and some writers have taken that proportion; but other experiments show that the smaller the body, the larger fraction of its weight is needed for food, and the greater activity of the fowl must also be considered. As a rule, we are satisfied that most farmers' fowls get too little food, and other people's, except those of experienced breeders, too much. The only safe general rule on this head is to give food as long as the fowls eat *eagerly*, and no more. That is not nearly what they would eat, or even eat with readiness: it means that as soon as they seem to be thinking about anything else than eating what is nearest them as fast as possible, or to choose amongst the food before them, the supply should be stopped. Many people, at first, will not think this enough, when they see the birds run or fly as if starving when feeding time comes round; but that is the sort of appetite that means health and vigour, in full-grown birds. To eat to repletion is always bad.

While this is a general rule, however, there may be exceptions, due to ill-health or other circumstances: for instance, a good and gallant cock would never get enough on this system. The condition of the birds should therefore be always kept watch upon, by occasionally feeling them at night. The fair "condition" weight for birds of their size should be estimated, and if they are found too heavy, or poor and light, the necessary modification should be made. In practice, the average quantity per meal for the whole pen or each pen of birds, will be known very soon by any intelligent person.

Soft and Hard Food.

The nature and time of each meal also needs consideration. Beginners who are not instructed often believe still, that grain is the only proper food for fowls, as it is the most "natural." Even people who ought to know better, harp upon this idea of "natural" food. It is true enough that Nature makes no mistakes in her own domain, but this is not her domain exactly. If we are to follow Nature, we must follow her altogether, and we must be content with her results. In this case Nature intends her fowl to be at perfect liberty, to get grass and herbs and insects and worms *ad libitum*, as well as seeds, and to lay either one, or at most two nests of eggs in the year, in the warm season. She also makes her subject find its food grain by grain, with abundant exercise, and never distending the crop. The result is splendid health, and hard condition, but no profit. We keep our birds in more or less confinement, even fair grass-runs yielding few insects; and we want either tender flesh, or many times the natural number of eggs. Such a copious product demands quicker digestion, and a greater amount of food. This we provide for by grinding up a considerable portion of the grain into meal, and mixing this with water into a paste, usually called soft food or mash. It is best, as a rule, to give this soft food in the morning. The birds have passed a whole night since they were last fed; and it is important, especially in cold weather, that a fresh supply should as soon as possible be got into the *system*, and not merely into the crop. Now, if grain be given, it has to be ground in the gizzard before it is digested; and on a cold winter's morning the delay is anything but beneficial. But, for the very same reason, at the evening meal grain forms the best food which can be supplied; it is digested more slowly, and during the long, cold nights affords support and warmth to the fowls. Let the sceptical reader make one simple experiment. Give the fowls a feed of meal, say at five o'clock in the evening; at twelve visit the roosts and feel the crops of the birds. All will be empty; the gizzard has nothing to act upon, and the food speedily disappears, leaving with an empty stomach, to cope with the long cold hours before dawn, the most hungry and incessant feeder of all God's creatures. But if the last feed has been grain, the crop will still be found partially full, and the birds will awake in the morning hearty, strengthened, and refreshed, though healthily hungry.

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* These remarks apply chiefly to the average climate of the British Islands, and would be modified in other countries. In North America the best month for hatching, for general purposes, is May, up to the end. The weather before that is often severe, and the warm dry season enables the birds to make more rapid progress; so that an American fowl hatched in May is often as forward as a British specimen a month older, by the end of the year.

Morning or Evening Mash.

While we are fully satisfied, however, after attentive observation and trial of other systems, that this is the best for the usual conditions of poultry-keeping in England, there may be exceptions, and especially where climatic conditions are widely different. As indicated in the first chapter, in North America the severity and snows of the winter necessitate in most cases entire vacation of the open runs for months together, during which the birds are confined in covered sheds, colloquially termed "scratching-sheds," open to the front when possible, but sometimes needing protection even there. Let any English breeder ask himself how he would like the prospect of keeping say fifteen fowls, shut in entirely for months together within a space of only ten feet square, beside their house; not only, be it observed, to keep them in health, but to force them by high feeding into prolific laying. He will then appreciate the difficulty of the task: how, in particular, would such a one dread an outbreak of feather-eating! The task can be, and is, only accomplished by providing the most active occupation and exercise. This is mainly effected by keeping the floor deep in straw or other scratching litter, in which a little grain is always kept scattered and buried; for, as one American breeder said to us, "If the hens find nothing by scratching, they get discouraged and won't scratch at all." On the other hand, they must not find grain very easily or too quickly, or they get too much. Some of these American poultry-farmers state, as their experience, that if the birds have a good meal of soft food for breakfast, they stand about satisfied, and will not scratch for more, and upon this idleness the usual mischiefs follow, besides the egg-yield falling off. Hence many of them prefer to give nothing in the morning but sufficient grain, which is well worked into the scratching-litter, and which keeps the hens busily active all day; in the middle of the day green food and cut bone; and last of all there is a good feed of mash or soft food before going to roost.

These considerations are of great weight, and some of the best averages of egg-production before us have been attained under this system of feeding, whilst the preceding one is freely pronounced "antiquated" by some prominent American writers. It may be freely granted that any system is fairly vindicated by good results, and even that in such circumstances, of long-continued close confinement, it may be well to adopt it. But the argument, or even the experience, does not present the whole truth. Even in America there are not a few who still adhere to the other system, and attain just as good results by it. Some of these reply to the advocates of evening mash, that their failures with the other plan were their own fault, for carelessly giving the birds so much as to make them torpid and idle. They do not feed so carelessly, but give a somewhat "short" breakfast of mash, after which their fowls, they say, are just as much disposed to hunt and scratch as the others'. There are plenty of farmers who state that they have tried the evening mash, and still prefer the morning one, when thus properly managed. This appears to us to be the truth. In very close confinement, if fattening and sterility and feather-eating are to be avoided, the morning meal of soft food must be carefully and rigidly *limited*, so that the birds are kept active afterwards, even in their small space. This requires time, and care, and intelligence; and if sufficient of these cannot be bestowed upon the feeding, it will be safest to give the mash at the evening feed. Where there is adequate open run, however, as is frequently the case, and which in Great Britain is available all the year, this danger does not occur, and a morning mash not too plentifully apportioned unquestionably gives the best results, and will be the best general rule.

Various Kinds of Mash.

Where only a few fowls are kept, to supply eggs for a moderate family, the soft food may be provided almost for nothing by boiling daily the potato peelings till soft, and mashing them up with enough bran, slightly scalded, to make a tolerably stiff and dry paste. The peelings must be boiled soft and mealy, and chopped up rather small. There will be sufficient of this if the fowls kept do not exceed one for each member of the household; and as the peelings cost nothing, and the bran very little, one-half the food is provided at a merely nominal expense. A very little salt should be added, and in winter a slight seasoning of pepper will tend to keep the hens in good health and laying. This food may be mixed boiling hot over night, and covered with a cloth, or be put in the oven: in either case it will remain warm till morning—the condition in which it should always be given in cold weather. Potato peelings may be, if necessary, eked out by scraps from the dinner table, and part of these are very valuable, especially the lean meat; but caution is necessary. Often such scraps consist chiefly of bread-crusts and fat. In neither is there any appreciable egg-material, and if too much of them be given, prejudicial fattening with muscular weakness is sure to occur. They can be used to a certain extent, but if they abound, only so far that they shall not exceed between one-third to one-half the bulk of the food, the rest being made up of sharps, or sharps with bran. To give more will be no economy, owing to the evil effects. The green vegetables will be beneficial, if any are left. To have much bread-scraps denotes of course great waste in a household. In any case, all the scraps used should go into the breakfast, and not be given in addition, as many do. Table scraps always need care and judgment in use, and we have traced many failures in domestic poultry-keeping to the practice of giving a fair breakfast of meal food, and then household scraps at mid-day beside. No fowls could long withstand such a regimen as that; first eggs must fail, and finally liver congestion will carry off the victims.

In the case of larger numbers of fowls, some definite "mash" will have to be decided upon for each day, or week, or more; a certain variety should be studied for the sake of health and appetite, and the market will also have to be consulted. Either ground oats, or a really good sample of middlings will be quite suitable alone: oatmeal (or hulled oats coarsely ground) is dear food by weight for mere egg-production, in spite of its admirable qualities; but it is all food, and goes far. If only for variety, the mash will usually have to be compounded. In this there is room for endless combination, but on that head sufficient has been said in the preceding chapter. Merely as further examples, we will quote here three different mashes from different sources in America, where the subject has been very systematically studied. (1) Equal weights of maize meal, ground oats, bran, and fine middlings. Here it will be seen that the oats and middlings are fairly high in ratio, and that the maize is balanced by the bran; but it is a common practice to mix further in this mash 1 lb. of cut bone, or scrap meat, or meat-meal, to each twenty-five hens. (2) Middlings 100 lbs., maize-meal (coarsely ground) 75 lbs., gluten-meal (an American product) 25 lbs., clover-meal 80 lbs., meat-meal 35 lbs. These are weighed dry, mixed with boiling water at night, and kept covered and warm to cook until morning; the mixture is from a successful egg-farm, and represents a high forcing diet. (3) Pea-meal 20 lbs., bran 30 lbs., oatmeal 15 lbs., barley-meal 10 lbs., meat-meal 20 lbs., wheat-meal 10 lbs., linseed-meal 15 lbs., clover-meal 40 lbs. We have selected this as an absolutely foolish extreme, the ratio being the tremendously high one of 1 : 2. One would also have thought such a complicated mixture unwise. But a bulletin issued from the Agricultural Department, U.S.A., affirms as the result of experiment that "in forcing fowls for egg-production it is found best to make up a ration of many kinds of grain. This invariably gives better results than one or two kinds, although the nutritive ratio of the ration may be about the same. It has been found by experiment that the fowls not only relish their ration more when composed of many kinds of grain, but that a somewhat larger percentage of the whole ration is digested than when it is composed of fewer ingredients."

The clover-meal here used is clover hay coarsely ground; and some use clover hay cut into fine chaff. In either case the clover has boiling water poured on it at night, and is left covered over with a cloth to "steep" and soften till morning, or the entire mixed mash may be left to cook in the same way. The birds then eat it eagerly, but if given raw or unsteeped, clover hay repels them.

We give one more mash as fed to his White Leghorns by Mr. Wyckoff, who obtained an average of 196 eggs from a flock of no less than 600 in all. It comprised 100 lbs. maize, ground fine, 200 lbs. oats, ground fine, 150 lbs. bran, about 8 lbs. dried beef scraps, all moistened with skim milk, which added to the albuminoids. At noon, green food was given—mangolds or cabbage in winter, clover or kale in summer, with sometimes a sprinkle of grain in the litter. At night they had mixed grain—in winter equal quantities of wheat, oats, good buckwheat, and maize; in summer the maize was reduced one-half. The use of bran, as rich in albuminoids, and laxative, is very general in America.

Some of the prepared foods are exceedingly good, and palatable, and convenient, but of course more expensive; for domestic use, however, this is balanced by household contributions. Spratt's and similar biscuit-meals are useful in this way, and Liverine may be mentioned as an albuminoid corrective; a mash of barley-meal, sharps, and Liverine would be very good, or one of biscuit-meal, bran, and potato peelings. We would only repeat, that while very useful as food, bran may occasionally cause intestinal irritation. This effect is not very frequent, but a watch should be kept where much bran is used, and on any symptoms of chronic diarrhœa the food should be changed for a while. It is quite possible that only special samples may be in fault. We have already said that some addition of malt-culms adds a great deal to the digestibility of such materials.

Feeding Vessels.

How the soft meat is given will depend on circumstances. Supposing a yard to be tolerably dry and clean, and that the proprietor or his servant can spend a few minutes over the fowls, it will be best to scatter it freely over the ground. Properly mixed, little dust or dirt will adhere to it, and every bird will get its share. But if the weather be wet this will hardly do, neither will it if the birds are confined in the shed, floored as this is with loose dust or sand. In such cases any common dish will do to put the food in, the quantity which the fowls need having been found by previous observation. A large garden saucer will answer, but if a dish can be procured with straight sides (as in Fig. 15) it will be better, as the fowls cannot then turn it over when they step on the edges, as they are apt to do with a dish wider at the top than the bottom: also they cannot rake the food out so readily with their beaks. A useful vessel for feeding a few poultry is one (Fig. 16) designed by the late Mr. E. Jones, a celebrated Spanish breeder of Bristol, which would be readily made in quantities of a dozen at any pottery. This dish is circular in shape, and of the section represented, thus presenting a saucer at both top and bottom, the size being about eight inches across, and five inches deep. If the wide face be placed on the ground, the saucer with upright sides contains the soft food (which cannot be scratched or raked out), stands perfectly firm and steady even if perched upon, and is sufficiently raised to prevent dirt being scattered into the food. When turned the other way it forms a water vessel, also raised from the ground, and which, from the slanting sides, does not touch the combs of Minorcas or other large-combed breeds, for which the ordinary poultry-fountain is not suitable on account of the size of that appendage.

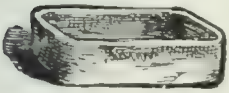

Fig. 15.

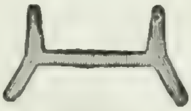

Fig. 16.

Troughs or vessels for larger numbers of fowls—such as twenty-five birds kept in one lot for laying purposes—often need to be protected, to keep the birds from walking over the food. Loose covers are best, supported on vertical bars or wires, as in Fig. 17. These can be obtained of appliance manufacturers in great variety, to fit loosely over various forms of troughs. For a rather smaller number, troughs with a cover hinged so as to fall back (Fig. 18) are more convenient. Something of this sort is better than an open trough whenever more than five or six fowls are fed together, for the reason that if they are properly hungry, they are too busy getting their own heads through the wires to pay much attention to driving others away.

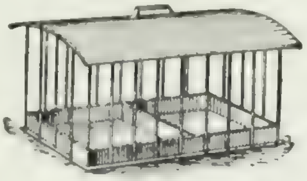

Fig. 17.—Loose Cover.

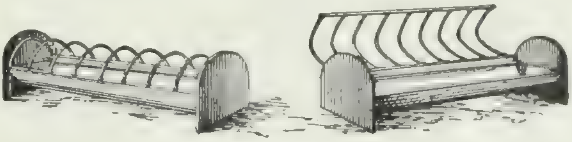

Fig. 18.—Hinged Cover.

Such a trough, whether covered or not, must be large enough for all the fowls to get to it at once. A plain open dish, however, does perfectly well for a few fowls.

Mixing of Soft Food.

The proper mixing of the soft food is important. By far the larger number of servants *will* mix it too wet and sloppy, to save a few seconds additional time; and give it as a sticky, porridgy mass which clings round the beaks of the fowls. Such feeding often causes diarrhœa, and in any case will rarely produce a proper egg-return. It is a universal rule that soft food should be so mixed that while none of the meal be left in powder or dry, the whole be so firm and "short" that a mass of it will break into fragments if thrown upon the ground; not on any account sticking with a "smack" as when a boy throws his lump of clay against a wall. All meal can be mixed this way if properly done, which is by stirring the water first well in with a spoon or stick, all remaining apparently too dry to mix thoroughly, and then kneading and squeezing it together in the hands. Food so mixed does twice the good, for the simple reasons that it is both more wholesome in itself, and more enjoyed. Meal combined with turnips or potatoes need not be mixed quite so dry; but all mash, rightly prepared, will be hard enough to be rolled out with a roller into a sheet, if required. Some good feeders prepare it thus, rolling it out and cutting the sheet into small finger pieces, which are thrown to the fowls; but when mixed "short" as above described, it will break up easily without this trouble. We should advise all mash being mixed with boiling water, so as to "scald" the ingredients, but it should only be given moderately warm. The warmth greatly promotes health and laying, especially in cold weather; and the food being a little swelled, and in fact really half-cooked before it is eaten, it goes farther, leaving less husk in the excrement. Where hay or clover chaff is used it must be scalded over night, for the reasons already given. The most celebrated and successful poultry superintendents we know always mix with boiling water; and where the contrary plan had been followed, and by their advice changed for this method, a marked improvement in the *condition* of the birds has invariably followed. We are not now considering prize poultry, it is true; but these men have spent their lives in studying the management of fowls, and what they find best for birds worth a score of pounds each will also be best for commoner fowls, such as can be bought for a few shillings.

Number of Meals per Day.

Grown fowls never require more than three meals per day, and are often better with two, but which really is the best depends upon what care and attention can be given. With even a fair open run to tempt them to walk about, and still more with a grass run, the birds will not get lazy with a fair breakfast: if the proprietor sees them standing about afterwards he may be sure they had too much. Such a breakfast, however, with the green food and etceteras they will either pick up or have given to them, will carry them on comfortably till the evening, when they should have a good feed of grain. Undoubtedly, however, it would be better to give a more scanty breakfast, such as would leave a tolerable appetite behind, and to give a very slight sprinkle of grain at mid-day; the mischief is, that the majority of those who give such an extra feed give it in addition to what is really an ample breakfast, and so the birds get overfed.

To keep fowls entirely confined in a shed in good health and laying, however, demands very careful attention to the considerations already referred to, drawn from American experience, where keeping them in a shed is necessarily practised wholesale. Here a scanty breakfast of mash is indicated, to be supplemented by a scanty feed of grain, well hidden under litter, so that it may occupy hours to find and eat all of it. The litter, for which straw, shells of grain, etc., are used in America, is, however, a difficulty in England, where there is no space to dispose of it when soiled, and material is not so available. The best plan seems to be to adhere to the scanty breakfast, and add a scanty noonday feed, but to work a little grain well into the loose material on the floor, well burying it, so that the birds may be kept scratching meanwhile: other expedients are mentioned presently in considering the question of green food. Let us repeat once more, that while a slight mid-day feed is better in itself, it must always be *deducted from the breakfast*, and the effect of the total always checked by now and then examining the birds at night, as already remarked.

Choice of Grain.

Grain is better not mixed. The fowls get more change if fed only one kind of grain at a time; and if two or three kinds are needed to balance the dietary, the same effect will be produced, in practice, by giving one at a time on two or three successive days, or a different grain for the noon-day feed. It has been already indicated, that on a really wide range fowls will thrive and lay well on grain alone.

The quality of all grain should be carefully looked after. Barley should be fair malting quality, not the narrow husky kind. Of oats, mixed horse-meat is useless; only heavy white oats, 40-42 lbs. per bushel, are good for fowls. Much buckwheat offered is either old dried-up grain, or kiln-dried; it is the fresh dark grain that is wanted. Of maize, the small round sort is best. "Poultry mixture" should be religiously avoided. It generally consists of the poorest samples, and prevents the birds getting any change. "Sweepings" sometimes contain poisonous substances, and should never be seen in a poultry-yard. Fresh brewers' grains are sometimes beneficial as a stimulant, are cheap and liked by the fowls, and have a food value, but of course are only obtainable in the neighbourhood of breweries. The respective food values of the different kinds of grain, on an average of good samples, will be found in the preceding chapter. Fowls rarely refuse any kind if kept in proper condition; when they do, they have probably been overfed.

What is termed "cockle-seed," which is not, as might be supposed, the seed of the plant of that name, but the refuse screenings of wheat, has been much recommended by a certain County Council lecturer, who is also noteworthy for the statement that 700 fowls may be kept for profit and in health in one house, upon two acres of land, for years in succession. At Liverpool and similar centres, where wheat is screened for milling in immense quantities, such food may deserve attention; but it varies much in quality. The chief components are the seeds of mustard, rape, clover, and grass, with sometimes a very little shrivelled wheat, linseed, etc., and the name is given because the screener is called a cockle machine. It is very cheap, and of fair food value on an average, but can only be had in certain localities, and has the objection that the fowls do not like it. Mr. Webster states that he did better with it when ground into meal; but then the fowls did not like it unless mixed with other meal: then they ate it readily. Such cheap food deserves a place in the dietary where accessible; but that will be in few cases, and fowls will pay well enough fed upon good grain. As might be expected, any general analysis of cockle-seed cannot be given, as it differs widely in character: American is said to be usually the best, and Russian or Danubian the worst in quality.

Animal Food.

The bulk of the food is now provided for, and we have seen that merely to keep the birds in health, animal food is not required. But if a good supply of eggs be expected it certainly is. The American experiments which have been detailed in the preceding chapter have shown that vegetable albuminoids, even though the ratio be made as high as with meat, have not altogether the same effect, and that *some* animal food is needed if a high standard of laying is to be kept up. For a small household establishment, the lean portion of the table scraps may furnish sufficient; if not the bones, cut or broken up *very small*, will do so, and will be eagerly devoured. Nearly an ounce per day for each bird in full lay will not probably be too much, if they really are prolific layers; but many only moderate layers could not use so much rich food in that way, and such hens would therefore be over-stimulated. On a larger scale, bones may be purchased from the butcher and cut in a mill. In America there are many makes of such mills, and in this country we have many excellent bone-cutting machines, such as Radcliffe's, Goddard's, and that shown in Fig. 19: all these mills *cut* the bones up, not crushing or breaking them. One caution is, however, necessary concerning bone: it must really be fresh. Tainted bones should never be used, and have been known to work mischief. Where bones cannot be procured, the various forms of granulated dried meat or meat-meal are useful; or bullock's liver, or horseflesh, or sheep's pluck, or any really sound offal may be boiled and minced up, using the broth also in mixing the mash. On a wide range, of course the natural supply of worms and insects will more or less reduce the quantity, or may make special provision needless.

On the whole, the best results are obtained by dividing albuminoids between the animal and vegetable classes. Through a wide extent of American practice, it seems usual to give roughly about half of the extra albuminoids in the shape of cut clover, and half in cut bone; and this combination appears to answer exceedingly well. We need not further refer to malt-dust, pea-meal, and similar articles: but special mention ought perhaps to be made of the high albuminoid value of *cabbage*, which is so readily grown on small plots of ground, and which in many places in England is more easily obtainable than clover can be. It is by some American poultry-farmers specially grown for the fowls, and fed to them, being minced or shredded up fine. It is thus given not merely as green food, but as *egg food*, of known value, and as paying for itself specially in the egg return; not only supplying albumen itself, but enabling the cooled system to assimilate better the animal food given beside. This seems the special function of clover or cabbage; it cools the system, and allows of a higher egg-ration than would otherwise be possible without evil.

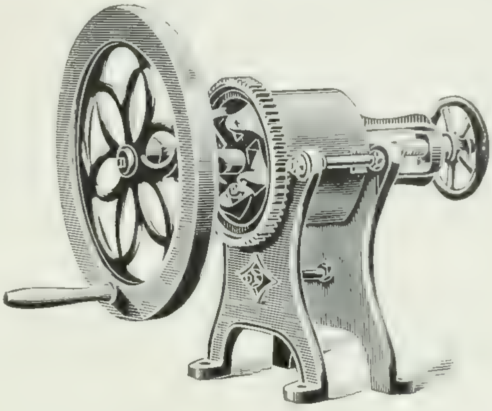

Fig. 19.—Furness' Bone Cutter.

Green Food.

This brings us to the question of green or fresh vegetable food in itself, and as such. A regular supply of this is *absolutely necessary* to keep fowls in health, all the more so in proportion to the confinement of their daily run; and the want of it, or of sufficient quantity of it, or regularity in giving it, is one of the most frequent causes of failure or disaster. An adequate grass run is of such great value, above all, as supplying this constantly without further trouble or care beyond mowing it occasionally whenever it gets long. Another very good plan, where possible, is to pay children a few pence weekly to bring fresh grass daily, pulled from the roadside. This must not be thrown in as it is, but cut into quarter-inch green chaff, by a pair of shears or a small machine; so cut it may either be thrown into the trough by itself, or it is perhaps better mixed in the mash, when all must get their share. The more given the better, so long as it is given *regularly*, and this plentiful and regular supply is the great preventive of diarrhœa; but great fluctuations should be avoided, and are, of course, liable to upset the digestive system. Lettuces or cabbages are excellent, and of distinct food value besides, as referred to above, but are better minced up. The outer cabbage-leaves are not so good; still, fresh ones will do very well for a small pen, as will other refuse vegetables, provided only sound portions are minced up, and so eaten; but cabbage stumps left lying about, or large leaves trodden under foot, become offensive, and may almost be called poisonous. Minced vegetables or fresh green weeds of any kind are usually eaten without leaving any, as are turnips, or beets, or mangolds, minced up small, which are sometimes the only available source of supply in winter. Such roots as the last may also be boiled, and mashed up with the soft food, but should not be reckoned in the weight of the latter. Something of the sort must be given to fowls in confinement *every day*, else their bowels sooner or later become disordered, and various ailments and vices occur among them. A very usual and good plan is to give a liberal allowance of green food for the mid-day meal.

Occupation.

While whole leaves and stumps must not be left about, however, it is often the best plan for fowls in close confinement, to hang up two or three whole lettuces, or the entire half of a split cabbage, or half of a large root, by a string from above, so as to hang loose some inches above ground. This is not as a matter of feeding, however, but in order that pecking at the swinging dainty may give *occupation*, and so prevent feather-eating or other vices of idleness. To find exercise and occupation in some way is of the last importance to fowls penned in a shed. It is for this purpose that American breeders keep the floor inches deep in straw, leaves, or other litter, under which the grain is buried to be scratched for all day. In many small town establishments so much bulky litter could not be either stored, or in due time got rid of, as is so easy upon an American farm; but fortunately, in most cases, there is more or less open run, from which fowls in this country are scarcely ever excluded. When they are penned up in a shed, however, the lesson thus given us should be studied. A little grain well raked into the loose material on the floor, and green food given in this special way, or a large bone from the kitchen hung up in similar fashion, will do much to keep the hens busy, and prevent mischief. It also affects laying; for experiments have shown that a very poor supply of eggs from a pen of birds allowed to become idle and torpid, was soon increased threefold when they were thus induced to work for their living: they also moulted earlier and more quickly than they had done before.

Lime and Grit.

In addition to their regular food it will be needful that the fowls have a supply of *lime*, in some shape or other, to form the shells of their eggs. Old mortar pounded is excellent, so are oyster shells well burnt in the fire and pulverised; of the latter they are very fond, and it is an excellent plan to keep a large pan full of it in their yard. If this matter has been neglected, and soft shell-less eggs have resulted, the quickest way of getting matters right again is to add a little lime to the drinking water, or pound up some oyster shells raw. Lime in the drinking water always, however, as some have recommended, is not at all advisable, and has led in several cases within our knowledge to disease of the kidneys. Where cut bone is regularly fed, it will of itself provide ample shell material. Pounded oyster or other marine shells appear, however, to be specially relished, for which there must be a reason. It probably lies in the supply they afford of *mineral salts* generally. Lime alone does not supply all the needs of a fowl in confinement, and experiments cited in the preceding chapter show how much effect upon growth, as well as upon laying, was produced by adding the salts contained in bone-ash to a grain and meal dietary. The breeder who cannot provide animal food regularly, or who prefers to keep such food within very strict moderation, will not overlook the lesson, and will seek to supply at least adequate mineral matter, in other ways.

One thing more must on no account be forgotten. This is, some supply of sharp grit or gravel, or other hard substances. Such small stones constitute *hen's teeth*, and without them the gizzard cannot perform its office of grinding up the food. We have seen fowls ailing from apparently this simple neglect alone. Flint grit is easiest to obtain, but some of that sold is too large and too sharp, and has been proved sometimes to lacerate the viscera. The best way is to make some flints red-hot, and throw them into cold water; they will then pound up more easily, and in better condition. Pounded crockery has been advised, but is unsafe, as it often contains lead-glaze; and pounded glass has several times been known to cause death from internal hæmorrhage caused by severe wounds. Grit for young chickens should be very small, only the size of very coarse sand. Some people carry the matter of grit too far, and mix it in the mash every time. If it is always in reach of the birds, adults will take what they need of it, and on a good miscellaneous range they will need no special supply, but pick up all that they require.

Water Supply.

The water supply is, in its way, as important as the food. The water vessel must be filled fresh every day at least, and so arranged that the birds cannot scratch dirt into it or make it foul. The ordinary poultry-fountain is too well known to need description, but better constructions, made in two parts, are shown in Fig. 20. The centre figure is generally made; both of the two others are patterns made by Spratts, and have some advantages in rather better protection of the surface of the water. The advantages of the double construction are that the interior can be examined, and the vessel well sluiced out to remove the green slime which always collects by degrees. For large-combed breeds it is necessary to use shallow pans; and Fig. 16 reversed, with the wide part uppermost, is a capital pattern. When the water has to be placed in a shed filled with loose earth, to which the fowls are confined, it should be a little raised, and a piece of board or other protection be so placed as to protect it from dirt being scratched into it. Grown up fowls must never be left without water. During a frost, therefore, the fountain should be emptied every night, or there will be trouble next morning. Care must always be taken, also, that snow is not allowed to fall into the drinking vessel. The reason has puzzled wiser heads than ours, but any real quantity of snow-water reduces both fowls and birds greatly in condition. Stale and sun-heated water is also very injurious, often leading to obscure diseases of an intestinal character; the fountain should therefore be kept in the shade. In very frosty weather it is best to discard fountains for shallow pans, which should be slightly greased; the ice will then not adhere to the sides, and there will be no trouble beyond filling the pans. In this case warm water is also advisable, and will often postpone freezing for hours, but the temperature should not exceed about 120° when poured into the pans.

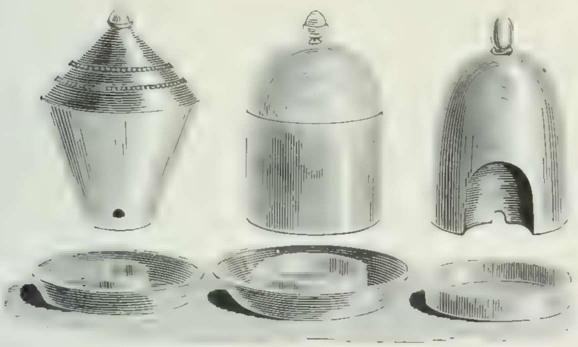

Fig. 20.—Water Fountains.

Some fowls undoubtedly do themselves harm by over-drinking. This may possibly be set up by some temporary feverish condition; but it is so common in confinement, that we suspect it is often a mere bad habit. It may be checked to a considerable extent by a bit of camphor in the water, or a few quassia chips, or a little iron. The camphor can do no possible harm, and is some preservative against gapes and catarrh; the very slight tonic effect of the quassia will be rather beneficial than otherwise; and in cold or wet weather the effect of iron in warding off catarrhal roup is well known. In such weather we would in fact always add iron to the water, in the shape of a small lump of sulphate (green vitriol) the size of a nut to half a gallon, or a teaspoonful of the ordinary chemist's tincture of iron. The sulphate will make the water rusty, but this can be prevented by adding a few drops of sulphuric acid. In hot weather, if it is thought that the fowls are drinking too freely, it will be better to use the quassia. Drugs of any kind should be used as little as possible while birds appear in good health and condition.

Moulting.

There is one special time of crisis in every season, however, when all fowls should be carefully watched, and need special care and treatment. The process of moulting, though a natural one, and usually a healthy one, is in any case a severe drain upon the system. Before moult freely comes on, the general condition should be ascertained. Those fowls get through moult the best which are just a little spare in body at the commencement, so that they may bear a little extra diet, and slight gradual increase in weight during the process. This should not, however, be begun till new feathers have actually started: whilst casting feathers only, a fowl usually has little appetite and should not be forced at all. And too poor condition is bad for them, though over-fat is still worse. Very special care should be taken in mixing their food, and the system kept cool by plenty of green food, which will enable the rather extra food to be better assimilated. A little malt-dust is also exceedingly beneficial in this way, and it is a comparatively recent discovery that a good pinch of powdered sulphur to each bird thrice a week, or every day if the growth of new feathers seems very rapid, has a good effect in helping the new plumage, when it has begun to grow; rape-seed, which contains sulphur, is said to have the same effect. Whether or not animal food has been used before, unless the birds have ample range a little should be given now, and some sunflower-seed will be exceedingly beneficial. The birds should be constantly examined, and endeavour made to graduate the feeding so that, if in the proper condition at first, they slightly and slowly increase in weight. Iron tonic should be given as above, right through the process. This is all that is necessary for a successful moult; some special points regarding exhibition stock must be dealt with in the proper place, and it need only be added here that it is very desirable only to keep fowls which moult fairly early. Late moult brings the process into cold and bad weather, when the birds suffer more in any case; late moults are also apt to be prolonged, and then it is very late before laying is resumed. Late-hatched birds, which moult late, are therefore never profitable, and should be displaced as soon as possible by others which are more likely to be so.

Cleanliness.

Cleanliness in both house and run must be the object of constant, unremitting care, which is perhaps most likely to be neglected in affairs of the smallest size. It is just where only a few birds are kept, that it is likely to be thought of little consequence, whereas to such a few, if penned up, and especially if entirely within a covered run, it is most of all important, even vital. Large establishments will be, of course, attended to systematically, and the easiest way of keeping the loose material in a number of sheds properly clean from the droppings of the fowls is to rake them daily with such a small-toothed rake as already described, made with about one-eighth inch wires set three-eighths inch apart; and once a week to cast all the material through a mason's riddle. One small shed should be treated similarly, but using a circular wire sieve instead of the riddle. The earth, or ashes, or road-dust should, if possible, be sifted in the first place: if so, and it is kept dry, the covered run can be then kept in good order, and no other dust-bath will be required, though a bare place should be fenced off for the fountain and for feeding. Our own plan used to be to keep away the loose stuff from a feeding place about four by three feet, by laying on the hard ground two pieces of timber, three by four inches, over which the fowls could step easily, but which fenced back the loose earth on the other side. Concerning the roosting house nothing need be added to what was said in Chapter I.

Poultry Manure.

The chief thing is that, even on a small scale, all this be *methodised*. It is not easy always to do so, but it must be done, including the disposal of the manure. When there is even a small garden there will be no difficulty, as fresh earth can be got as often as required to replace that discarded, and the manure from a few fowls can readily be used. The collected manure should be stored in an old cask or some vessel where it will be kept dry, and some time before using it should be mixed with dry earth, and any soot, or fine dry ashes, or burnt weeds that may be available. It is excellent for nearly all things if not used too strong, as it generally is. Another way to use it at home is to put some in a watering-pot, fill up with water overnight and stir, and use the liquid. In spite of its real value it is not a saleable article as a rule; but twice, in different localities, we found a nurseryman who allowed us 4s. per hundredweight for ours, against such small things as we needed from him.* If some such arrangement can be made it will help matters, but of course the manure from only half a dozen birds is not worth anyone's while to take away, and should be used on the garden plot, or smuggled into the dust-bin. Owing to the need for clean material and for disposal of manure, some plot of garden ground seems almost necessary in connection with a pen of fowls. If there is none such at all, the best plan is to keep the main part of the covered run hard and smooth, cleansing this with a scraper, and supply a dust-bath in one corner from the household ashes sifted fine, which can be discarded in the dust-bin periodically. The difficulty in such a case is likely to come from want of scratching material and exercise. It is in precisely such circumstances as these that feather-eating is most likely to follow the least neglect, and should be guarded against by keeping even fewer birds than usual, by the most sedulous attention to proper diet, including a due proportion of green and animal food, and by constant precaution against insect vermin, which is, beyond doubt, the proximate cause of this vice in many cases.

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* Respecting the real value of poultry manure, see Chapter VIII.

Insect Vermin.

The first essential in this warfare is, of course, constant attention to the dust-bath, both to keep it supplied with clean material, and to keep it dry. The dust-bath itself will harbour vermin if not properly renewed, and if it is damp the fowls cannot use it, and have no resource. Where this is attended to and the roosting-house kept clean, there will usually be little trouble. All the walls should be gone over twice a year if possible with hot lime-wash, to which is added one ounce of carbolic acid in crystals to every gallon. Where there is the least suspicion, this should be not only laid on, but well "worked into" all chinks and crevices with a hand-brush. The ends of perches and shelves, and anything else that makes a chink or crevice, should be lifted every now and then to see if the "red mite" is making any lodgment, and the places painted with kerosene oil. Dilute carbolic acid may also be "sprayed" all over the walls, which is easily done by filling a glass bottle, stoppering it with a cork in which a small groove or notch is cut up one side, and swinging the bottle round, when the dilute acid will spray out through the small groove in the cork.

Any fresh purchase should always be most carefully examined for vermin; to do this often saves much trouble. If found infested with any, a bird should be isolated for a day or two, and meantime well treated with some insecticide, well rubbed into her plumage all over down to the roots, and especially the under-parts of the body, and fluff round the vent. The powder of *Pyrethrum* (of which one brand is well known as Persian Powder) does well for this. A second application may be necessary. Another cheap and good insecticide powder is made by rubbing up powdered sulphur with as much dissolved carbolic acid as can be taken up without making it a paste or moist; this may be well dusted and rubbed into the plumage in a similar way. Other expedients, and the American method of fumigation and treatment of the houses with volatile compounds, will be found in the final chapter of this work. The nests also need attention, changing the straw, or fern, at proper intervals; fusty straw always means vermin. A couple of lumps of camphor at opposite corners of a nest will do much to repel lice. At moulting time feathers should also be cleared up and, if possible, burnt every day or two; leaving them about is a fruitful source of vermin.

Eggs.

Eggs should be looked for regularly, and if possible twice a day. It is a curious thing that many country servants, otherwise fairly honest, seem to have no conscience at all concerning eggs, and a lock on the door often produces surprising results. If hens look healthy and red, and "prate," and are known to go to the nest, and still there are no eggs, it is time to look into matters. Again and again we have personally found the suggestion of locks upon the doors received with indignation; but nevertheless its adoption speedily resulted in hen-fruit. Of course, there might also be egg-eating by the hens; but if such be the case it is quite as needful to discover that. Want of eggs, when due allowance has been made for age, time of year, and all other known circumstances, should never be accepted as a normal state of things, but every attempt made to trace its real cause.

For this and other reasons, wherever any chickens are reared pains should be taken to recognise, if possible, the egg laid by each particular hen. In the case of a few only kept for household supply, any regular attendant can very soon manage so much, without any doubt or difficulty. Out of any half-dozen hens got together to start with in the ordinary way, it is probable that about two will lay very well and pay a large profit, three more a fair mediocre number, paying a small profit, and perhaps one very few indeed. Such poor layers should be weeded out anyway; and when chicks are reared, only eggs from the *best layers* should be saved for hatching. In this way enormous improvement can be effected; but this subject will be further discussed in a subsequent chapter. Meantime, and merely to show its vital importance, we may record that at the experimental station in Maine, U.S., Professor Gowell once placed 260 April- and May-hatched pullets in breeding pens, and by trap nests the laying of every bird was recorded for twelve months, commencing on the 1st November, but those not laying then, being reckoned from when they did begin. Five died, and 19 were stolen: of the balance of 236 birds, 39 laid 160 or more, and 22 birds less than 100. Three only laid 36, 37, and 38 in the year, while the five best laid 200, 201, 204, 206, and 208. The last bird had laid a fortnight before she was counted, and in the ensuing first six months of a second year laid 112 more. Some birds laid well one month and very badly the next, while others laid well continuously. No "egg-type" could be observed to account for these differences: the poorest layers looked as promising as the others, and all of each breed were of the same breeding. The best layer, mentioned above, was a White Wyandotte, whose record closed at the end of April of the second year.

All eggs should be marked with at least the date laid, and it is best to do this on the small end, and keep them for household use in a board pierced with holes, small end upwards. If more than the date be required, for breeding purposes, it is still best to mark them on or around the small end, for the simple reason that the chick breaks the shell round the large end, and any mark made there may be destroyed.

Profit in Poultry.

The profit of what may be called domestic poultry-keeping, or from any moderate number of fowls, when properly managed, should be very large, but will depend more than anything else upon the average number of eggs obtained from each of the birds. How very greatly this may differ, we have seen above. The food certainly should not exceed one penny per week each, where eked out to any extent by household items; and a bird discarded as too old is worth nearly her cost on the family table, and will be relished there. On a larger scale, where all has to be purchased, the cost may rise to three-halfpence per week. Thus even one hundred eggs in a year will pay a fair profit. American breeders and poultry-farmers are not now satisfied, however, with less than one hundred and sixty-five per annum, and some of them get considerably more; and fowls can be obtained even in England which have been, to a large extent, bred for laying, and will lay one hundred and sixty eggs or more when properly fed. Such laying should, in these progressive days, be looked for and fed for; and if chickens are reared, they should be systematically bred for, as hereafter described. The profits from such egg-results can readily be estimated.

Wherever more than three or four birds are kept, food will of course be always purchased with reference to the market, and in economical quantities. Metal bins or receptacles are far the best, as they protect grain and meal from rats and mice, and in so doing, do much to prevent those vermin from infesting the establishment. Capital bins for a small concern may often be found in the large circular iron drums or casks in which paint, oil, printing-ink, and similar goods are sold. If they are turned on one side, and lighted paper or sticks thrown in, the remains of their former contents will catch fire, and they may be rolled about till "burnt out" clean. For a very few birds a large canister or covered pail may be sufficient.

But the whole affair, on even the smallest scale, should be conducted as a matter of business. An account should be kept, of course. In a small way, a cash account and an account of eggs and produce will be sufficient; the amount of figuring some fussy people will get out of three old hens is amusing, but is quite needless, and apt to prove tiresome. As the scale of proceedings enlarges, more may be necessary; every incubator will need its own register, and every breeding hen the same, and both payments and receipts will have to be sorted under different headings. As a general rule simplicity should be studied, so far as consonant with efficiency, however: too elaborate accounts get neglected, and defeat their object. It is enough for most people if the profit or loss of each *branch*—as egg production, or sale of newly hatched chicks, or rearing, or fattening—can be distinguished from the rest; then any losing department may be either overhauled, or perhaps discarded to the profit of the exchequer. All these things will often give invaluable change of thought and occupation to wearied men of business, to whom a "hobby" of some kind may mean physical salvation. No such man of business, who gives a little of his own attention to it, will long remain unconvinced of the profit there is in keeping poultry.

CHAPTER IV.

THE EGG AND SITTING HEN.

EVERY animal, of whatsoever kind, is developed from the egg-form, or as physiologists express it, "*omne animal ex ovo.*" But the mode of that development differs, in one detail especially. In mammalia the egg is retained throughout within the body of the mother, which is its sufficient protection, and the development is uninterrupted. In oviparous animals, such as birds, the egg is enclosed in a hard protecting shell, and at a certain stage of development extruded from the body of the mother; in this case development is arrested at that point, and may, or may not, be resumed and completed.

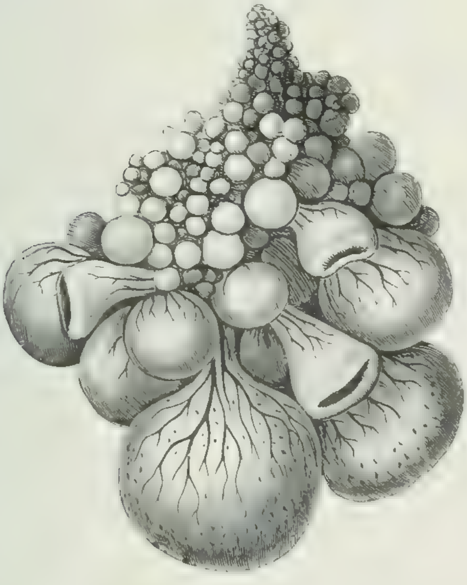


Fig. 21.—Ovary of Laying Hen.

Formation of the Egg.

The ovary of a hen during or near her laying season presents an appearance much like that of a cluster of fruit, and is accurately shown by the illustration (Fig. 21.) There are, strictly, two such organs in every bird; but one remains merely rudimentary and undeveloped, the fertile one being almost always that on the left of the spine, to which it is attached by means of the peritoneal membrane. By the ovary the essential part of the egg, which consists of the germ, and also the yolk, is formed, each yolk being contained within a thin and transparent ovisac, connected by a narrow stem or pedicle with the ovary. These rudimentary eggs are of different sizes, according to the different degree of development, and during the period of laying they are constantly coming to maturity in due succession.

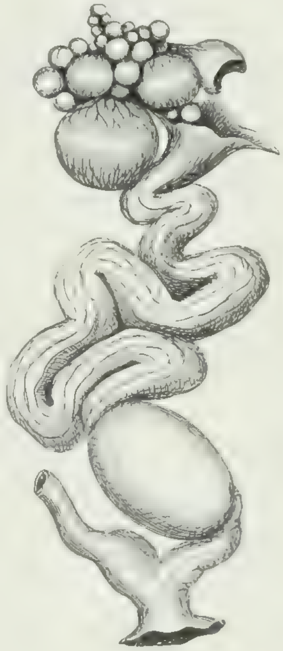


Fig. 22.—Ovary and Oviduct.

As the yolk becomes fully matured, the enclosing membrane or *ovisac* becomes gradually thinner, especially round its greatest diameter or equator, which then exhibits a pale zone or belt called the *stigma.* Finally, whether or not fecundation takes place, the sac ruptures at the stigma, and the liberated yolk and germ, surrounded by a very thin and delicate membrane, is received by the funnel-shaped opening of the *oviduct* or egg-passage, whose office it is to convey it to the outer world, and on its way to clothe it with the other structures needful for its development and preservation. This organ, with its various convolutions a little modified for convenience of representation, is shown in Fig. 22, and in an ordinary hen is nearly two feet in length. It will easily be seen how *two* yolks may become detached and enter the oviduct at nearly the same time; in which case they are likely to be enveloped in the same white and shell, causing the "double-yolked egg" so well known to every poultry-keeper.

Thus received into the oviduct, the yolk becomes enveloped in a glairy fluid called the white, or by chemists *albumen*. This is secreted by the mucous membrane of the oviduct, and added layer by layer as the egg passes on. The uses of the white or albumen are manifold. It is eminently nutritious, forming indeed the chief nourishment of the chick during its growth in the shell; as it becomes absorbed by the little animal, and forming as it does by far the greater part of the egg when laid, it gives the fast-growing little body the needed increase of room; it is a very bad conductor of heat, and hence guards the hatching egg against the fatal chills which would otherwise occur when the hen left the nest; and finally, it preserves the delicate yolk and vital germ from concussion or other violent injury.

At a still farther point of the oviduct the egg becomes invested with the skin or parchment-like covering which is found inside the shell. In reality this skin consists of two layers, which can easily be separated; and at the large end of the egg they do separate entirely, forming the air-chamber. At first this chamber is small, but as the egg gets stale it becomes larger and larger, so that even in eggs stored it fills at length a large portion of the space within the shell, the egg itself drying up in proportion. In eggs on the point of hatching it usually occupies about one-fifth of the space. It has been proved by experiments that the perforation of this air-chamber, even by a needle-point, is an effectual prevention of successful hatching.

In the last portion of the oviduct the egg becomes coated with that calcareous deposit which forms the shell, after which it passes into the cloaca and is ready for expulsion. In some breeds colouring matter is added over the solid ingredient, producing the deep-coloured eggs of the Cochin, and in other birds the splashed and spotted patterns so well known. In fowls which lay coloured eggs similar splashes often occur, and we have had Brahma hens which laid eggs with a white ground, covered thickly over by chocolate-coloured spots. We have had others, again, lay eggs covered apparently with a coat of whitewash, which on being rubbed off with a rough cloth, revealed the usual buff-brown tint beneath. All these things obviously depend on some peculiar condition of the secreting organs, as does the shape of the egg of each bird when finally laid.

Occasional departures from the ordinary type of egg will now be understood. If the latter portion of the oviduct be in an unhealthy condition, or if yolks be matured by the ovary faster than shells can be formed by that organ, "soft" or unshelled eggs will be produced. If, on the contrary, the oviduct and its glands be active, while the supply of yolks is temporarily exhausted, the diminutive eggs, which consist of only white and shell, and which not infrequently terminate the laying of a long batch, may be expected to occur. Disease extending to the middle portion of the passage may result in eggs without even the membranous skin; and if the entire canal be in an unhealthy condition, yolks alone may probably be dropped without any addition whatever, even of white. This last occurrence therefore denotes a serious state of affairs, and should be met at once by depletic medicines, or it will probably be followed by the loss of the bird.

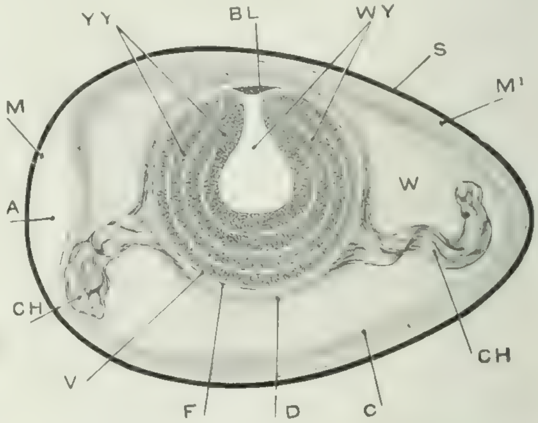


Fig. 23.—Diagram of an Egg.

BL, blastoderm. WY, white yolk. YY, yellow yolk. V, vitelline membrane. F, layer of very fluid albumen round the vitelline membrane. D, dense albumen enclosing the yolk with preceding envelopes. In this envelope D are incorporated the ends of CH, the chalazæ. W, body of the albumen. C, somewhat denser layer of albumen, surrounded by a fluid layer. M M^1, outer and inner shell membrane, separated at A, air-chamber. S, shell.

Structure of the Egg.

Let us now consider the egg itself, which is a much more complicated organism than many people are aware of. There is much even in the shell S (Fig. 23) to excite our interest. It is composed chiefly of prismatic particles, so arranged as to leave pores or interspaces between them. As laid, the shell is of enormous strength, so that it will resist great pressure between the palms of the hands applied to the opposite ends; though it is not correct that, as we have seen stated, "the strongest man cannot break it" in this way. Still, for its thickness and texture, its strength is phenomenal. As hatching proceeds, however, the carbonic acid and dioxide formed by the breathing of the chick, dissolved in fluid, gradually dissolve a portion of the material, and thus the prismatic bodies are slowly softened and disintegrated. The shell thus becomes far softer and more brittle as hatching approaches; and so great is the difference, that if the edge of a fracture made across a fresh egg-shell, and another of one hatched or hatching, be examined under a microscope, it will be instantly seen that the two are in a quite different molecular condition. Were it not for this beautiful provision of Nature, the chick could never break the shell.

The outer and inner shell-membranes M and M^1, separating at the air-chamber A, need no further explanation. Proceeding inwards, we come next to the white or albumen W. This is composed of a denser, and a more fluid kind, arranged in layers, which can be peeled off in a hard-boiled egg, like the layers of an onion. A layer of the more fluid kind is always next the shell, and another thin one, F, next the yolk, but enveloped by another layer, D, of the dense kind. If an egg be broken into a basin, there will further be observed attached to two opposite sides of the yolk, two slightly opaque and rather twisted thick cords, C H, of still denser albumen, termed the *chalazæ*. They are not attached to the shell, but to opposite sides of the dense layer of albumen, D, which envelops the inner fluid layer and the yolk. They are so attached at opposite sides, rather below the centre; thus they act as balancing weights, keeping the side of the yolk which carries the germ always uppermost, and very nearly in floating equilibrium. If the egg be turned round, therefore, the yolk itself does not turn with it, but retains its position with the germ on the upper side.

It will be seen how elaborately and beautifully the yolk, bearing upon its upper surface the tender germ, is protected within the egg. Itself rather lighter at the upper part, it is further balanced by the *chalazæ*, so as to float germ uppermost in the albumen. It is usually very slightly lighter than the albumen, but scarcely perceptibly so; thus it floats near the upper side of the shell, but always separated from it by a layer of albumen of more or less thickness, and oscillating gently away from the shell on the least motion. In a few cases it probably floats more strongly up against the shell, and these are generally the cases in which adherence takes place, or the yolk is ruptured during hatching; but an exquisitely delicate floating balance is the rule. Nevertheless, it will be readily understood why it is inadvisable to leave an egg, and above all a hatching egg, lying on the same side for any length of time. The shell being porous, and permitting of evaporation, such a course keeps the germ close to the portion of albumen which is slowly drying up, and may cause a tendency to adhesion.

Turning now to the yolk, this is contained within a very delicate vitelline membrane, V. It is composed of both white and yellow cells, and if an egg be boiled hard and cut across, it can be seen that there is a flask-shaped nucleus or centre of white yolk, W Y, round which are several concentric layers of yellow yolk, Y Y. Under the microscope additional thin layers of white yolk cells can be distinguished amongst the yellow layers. On the top of the white yolk rests the *blastoderm* (germ-skin), a small disk about one-eighth of an inch across, shown at B L. The difference between a fertilised and an unfertilised egg is solely to be found in this small disk, and much of its detail can only be distinguished under the microscope; but with a pocket lens it can be discerned that whilst in an unfertilised egg the little disk is whitish, all over, except for small clear spots very irregularly distributed over its surface, in the fertilised egg an outer ring or margin is whitish while in the centre is a smaller clear circle, in which are very small white spots. This central clear space is the germ from which the chick will be developed.

Early Development of the Egg.

It should be clearly understood that, at the stage when thus examined, after the egg has been laid, development or "hatching" has *already been carried on* to a certain extent, due to the eighteen or twenty hours it has been subjected to the heat of the hen's body whilst traversing the oviduct. As it entered the oviduct, the germinal disk consisted of only a single cell. During its passage this cell becomes traversed by successive furrows or divisions, dividing and sub-dividing it into many cells—the first stage in developing a real *organism* out of the *single cell*. This process goes on not only on the surface, but beneath, so that by the time the egg is laid, the blastoderm consists of two sheets or layers of cells. At about this stage the egg should be laid, and with the cessation of warmth the process ceases, or nearly so, but not exactly at the same point in every case. Perhaps the most wonderful thing about an egg is the power it has of keeping the development, already commenced, suspended for a time when warmth is withdrawn; to be resumed and carried on whenever the necessary warmth is restored.

Several points which puzzle many people will now be understood. It may happen that an egg is retained for a day or two beyond the natural time; in that case the development or hatching will be continued, and the new-laid egg may contain a visible embryo. Again, since even the new-laid egg is already an *organism*, which has attained a certain stage of growth, it is subject to disease, or weakness, or accident, like other organisms. Thus an egg may be fertile, and the germ may begin to develop, but may perish at any stage from sheer lack of strength, precisely as a weakly baby may die at any age. Quite apart from accidents or injuries whilst hatching, there is no doubt that in many eggs the embryo is not strong enough in itself ever to come to maturity. Such deaths at various stages, within the shell, are in no essential respect different from deaths of weakly chickens at various early stages after leaving the shell; the necessary vigour may fail the infant creature at any particular time. So also the embryo can be injured within the shell in various ways; and while it might be fanciful to say it can be "frightened," there is much evidence to show that it may suffer from some kind of nervous shock, as in a severe thunderstorm.

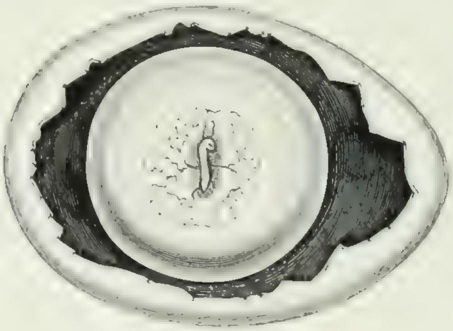


Fig. 24.—Chick on Second or Third Day.

Whenever the egg is again subjected to a heat analogous to that of the hen's body, the process of development is resumed, if the interval has not been too long. There can obviously be no definite limits to such an interval. We have sent eggs to America which hatched 60 per cent. after that voyage, and an entire interval of thirty days; and many sittings have similarly hatched, after crossing the Atlantic. On the other hand, in the earliest days of artificial incubation it became notorious that eggs laid more than four or five days, hatched then rarely and with difficulty, proving that after a very few days there was a change for the worse in the vigour of the embryo. Yet again, a hen allowed to steal her nest almost always hatches well; and it seems probable that her periodical visits, with their short intervals of warmth (for a hen at liberty rarely remains on the nest more than an hour when laying), refresh and re-invigorate the germ, and probably may even carry on farther to some minute degree, the process of development.

Development during Incubation.

It is needless to describe in detail the development of the chick when steady incubation has been commenced. A few hours enlarge the central pellucid spot, which becomes oval, with a furrow down the centre, and blood-vessels appear round it; then begins to develop a double membrane called the amnion, which at a later period entirely encloses the embryo along with what is called the amniotic fluid. By the second or third day the tiny embryo enclosed in the amnion can be clearly seen as in Fig. 24, surrounded by a patch upon the surface of the yolk which is covered by fine blood-vessels. The eyes can also be seen with a magnifying-glass, as dark spots, and even the pulsation of the heart. At or soon after the third day another growth called the *allantois* begins to push out from the digestive canal of the embryo, between the two coats of the amnion, and at a later period also encloses the embryo. By the fifth or sixth day the allantois may be observed as a bag or sac protruding from the navel, independent of the yolk-sac (Fig. 25). By this time rudiments of the wings and legs can be clearly seen as buds or small clubs standing out from the surface of the body, which has grown a great deal. The network of blood-vessels has also extended, and the yolk-sac is larger and more defined. This and the developing allantois, at about the seventh day, are more clearly shown in Fig. 26.

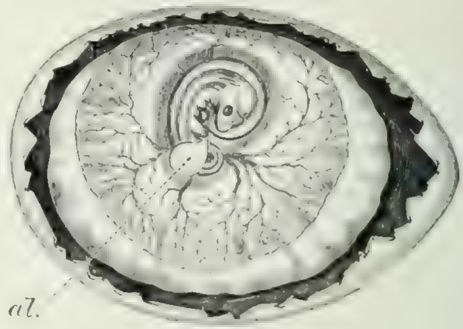


Fig. 25.—Fifth Day: *al*, allantois.

The allantois is, however, flattened and spread out in reality between the outer and inner layers of the amnion, where it gradually extends till it entirely surrounds the growing chicken, close to the outer shell and membrane of the egg. It is furnished with a beautiful network of blood-vessels, extended under the porous envelope of the egg, while at the umbilicus they are in connection with the young chick. The allantois, with its capillary blood-vessels, thus serves as a temporary lung by which the blood is oxygenated from the outer air, the chick not being able to use its true lungs till the very eve of hatching. The allantois is thus a structure of cardinal importance to the life of the growing chick.

At the tenth or eleventh day (we speak of a hen's egg) signs of the feathers can be distinguished, and motion of the young animal is often perceptible when the egg is opened. Generally about the nineteenth day the beak ruptures the membrane which divides off the air-chamber, and the chick for the first time breathes air through the lungs, after which the chick's blood gradually ceases to flow into the veins of the allantois, which has completed its work and is no more needed. Finally the chick breaks the shell by the aid of a sharp-pointed hard scale, specially provided for the purpose at the tip of the upper beak. It should be noted that the *constant* tapping sound often heard for the last two days, is not due to this process, but was shown by the late Dr. Horner to be due solely to respiratory action: the breaking of the shell is due to more violent spasmodic movements only made at intervals of five to ten minutes. The arrangement of the chick the day before hatching is shown in Fig. 27.

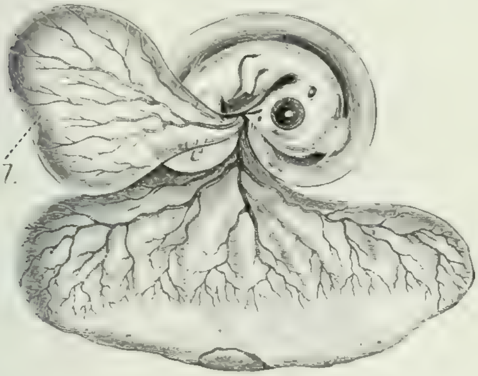


Fig. 26.—Seventh Day: allantois, *al*, more developed. Yolk-sac shown in connection with the navel.

Nourishment of the Young Chick.

During this process of development the embryo has at first been lying as a small object on the upper surface of the yolk; later on, as it increases in size and definiteness of form, it is clearly apparent that the neck of the yolk-sac is in connection with the umbilicus or navel (Fig. 26). The material needed for growth is therefore derived primarily through the yolk; but as the original yolk-matter is absorbed, it is replaced by fresh material from the albumen, drawn through the delicate membrane. The albumen comprising much of the bulk of the egg, it is manifest must furnish much of that of the chicken; but it passes through the yolk-sac in this process. Shortly before hatching the entire remaining nutritive material of the egg is gathered within the considerably shrunken yolk-sac, communicating with the umbilicus of the young bird, as in Fig. 28; and during the last few hours it is rapidly drawn into the abdomen, where it furnishes food for the newly born chicken during the first day of its independent existence. In chickens this process is often not complete, a portion of the yolk being still visible outside the abdomen; and American researches have traced this as being generally the result of too great *variation in temperature* during incubation, or of too great heat. Such chicks may in spite of this grow up quite strong, the process being completed outside the egg, but as a rule they perish from weakness. The yolk can still be clearly distinguished in most newly hatched chickens, and remains of it can

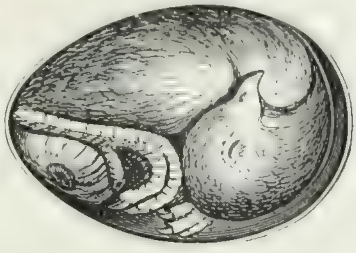


Fig. 27.—Nearly ready to hatch.

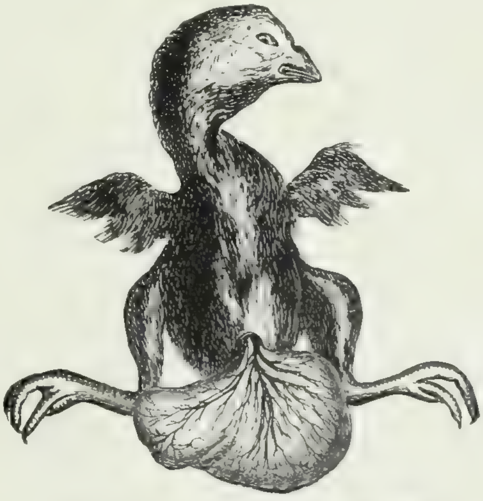


Fig. 28.—Chick two days before exclusion.

be found, on killing and dissection, for a period of five to ten days. This matter is fully explained in order that the entire independence of the chicken upon any food for at least twenty-four hours, or even more, should be quite evident. It also accounts for the small amount eaten during the first week of a chicken's life.

Storing Eggs.

We may now pass to practical points, and first amongst these is the securing and keeping of eggs for sitting in good condition. They should be collected at least once every day, lest they be partially incubated by the laying hens, and twice a day is better; indeed, in very cold weather, unless the house is sheltered, it is desirable to get them in out of the frost even oftener than that, since a few hours of frost may kill the germ. The nests must be kept clean, with fresh, well-broken straw renewed as required, and it is important that every nest should have a nest-egg from the first, to teach the hens to lay there. Nest-eggs of unglazed white pottery are very serviceable.

Eggs are best stored in a cool but not very cold place—about 50° to 60° is best—and with the *large end down*. We gave this advice as far back as 1872, after considerable testing of it to that time: all our subsequent experience has corroborated its soundness. There is a distinct percentage of better result every way when eggs are stored in this position, if the other circumstances are equal. The air-chamber is less expanded when so stored, and even for eating, after some weeks there is perceptible difference in the "freshness" of eggs thus kept. Eggs may be stored in this position either in bran or in a board pierced with holes; and if the board, or the bran-case, be covered over by a piece of blanket or sacking made to fit, and a cool and quiet place is available, the very best will be done for the eggs. The covering over is not to keep them warm, but to prevent draught, which increases evaporation of the fluid contents, and enlarges the air-chamber: this process we want to retard as much as possible. If eggs are kept on their sides they should be turned every day or two; and we remember seeing the announcement of an appliance maker that if eggs were turned daily, they would hatch after six or even twelve months, a statement not, however, borne out by experiments.

Preserving Eggs.

It is often desired to preserve summer eggs for winter use, and there are several methods of doing so. Some housekeepers smear them all over with butter; others bed them in dry salt, or even in bran, which answers fairly for three months. Strong brine will keep them longer, but hardens the whites and imparts to them a saltish taste; and a much better liquid medium is prepared with two gallons of water to a pound and a half of quicklime, ten ounces of salt, and two ounces of cream of tartar. Bedded in this liquid, eggs will keep fairly good for nearly a year. A more recent method, adopted by several large firms, consists of exhausting the air space within the egg and then hermetically sealing the pores of the shell with hot paraffin wax; this, however, entails special plant.

By far the best method, however, for the average poultry-keeper is to place the eggs, as soon as laid, in a solution of *water-glass* (silicate of soda), which is now largely sold by chemists for the purpose. It is a greyish-white liquid about as thick as treacle. One pound of it should be mixed with about a gallon of water boiled to expel air (measured after the boiling); if the eggs float in this a little more water should be added. This liquid should be kept in glazed earthenware jars, *not metal*, stored in a cool place, and, provided that genuine fresh eggs are put in, the jars carefully fastened to prevent evaporation, and that the eggs are covered by the water-glass, they will eat like new-laid for several months after, and keep exceedingly well for eighteen months. After six months they crack when boiled, but if the shell be pricked before cooking, even this can be obviated. So perfect is the preservation that *hatching* of eggs six months old, after dissolving the silicate entirely off the shells, has been reported in the *British Medical Journal*.

Whatever process be used, it is important to store or treat the eggs the same day as laid, if they are fertile eggs. But there is no doubt at all, and it has been proved by many experiments, that sterile eggs, laid by hens without a mate, keep considerably better than fertile ones. Whether hens lay as well without a mate as with one is a point that has occasioned much discussion. The one point that does emerge from it is that there can be very little difference, since both propositions have much testimony. In a small pen we think hens are more *contented* with a mate, and we have many times had, as we think, proof that mating up affected somewhat the date of laying. But in larger runs, with flocks of laying hens, these points would not be very noticeable, and there is no doubt whatever as to the superior keeping qualities of sterile eggs.

Hens not infrequently acquire the pernicious habit of eating their eggs, sometimes perhaps from accidental breakages. Often such a habit may be cured by filling carefully emptied egg-

Egg-eating Hens.

shells with nauseous compounds, of a yellowish colour, like strong mustard, or carbolated vaseline. We have seen a hen eat the whole of a single mustard-filled egg without ruffling a feather; but generally if the plan is persevered with, and such prepared eggs regularly left in the nest and about the yard, the habit will be conquered. There is, however, a more certain plan, which we owe to the experience of American farmers, who often suffer far more largely in this way, owing to long close confinement during the winter. There is a very large agreement amongst these experienced breeders that the best, most certain, and in fact almost invariable cure for egg-eating, is to give a *free supply* of either eggs or egg-shells for a few days! Some of them regularly save up their egg-shells for such contingencies, showing how common the trouble is under the conditions; others get them from the restaurants. At first the hens just go for them! And they are given the shells freely, for breakfast, dinner, supper. But soon the appetite palls; by the end of the second day they care little, and on the third, fresh eggs may be rolled about among them with impunity. The editor of one of the American poultry journals states: "We have tried this plan for some years, and have never known it to fail. We save up our egg-shells, and have a stock on hand for any pen of fowls that shows a tendency towards the egg-eating habit. This remedy has never failed us." Then a farmer writes: "Go to the bakery and get a basket of fresh egg-shells; give them to the hens as fresh as you can, and throw them in whole; don't dry them, or break them up, but give as fresh and whole as you can get them. Give them all they will eat, and throw in some more, and keep them before them all the time for a few days, and your hens will stop eating their eggs." Others report that they have given the entire eggs, using unfertile ones tested out of the incubators. "At first the hens would trample all over each other to get at the broken eggs, but before they got through, they wouldn't touch an egg." There is a whole pile of testimony to the success of this cure.

Another way of meeting the vice is to employ nests so constructed that the egg rolls away out of the hen's reach as soon as laid. The first nest we ever knew so made was figured in a journal of forty years ago, as in Fig. 29. The board A is inclined so that the egg rolls down it as at B, on to some straw. We found ourselves that hens refused to lay in a nest made exactly like this; but by making A of carpet, which sagged a little in the middle, and cementing a nest-egg half-way through as at C (or cementing half the egg on the carpet), they would do so. The portion B should also be of carpet or some soft material. A box merely furnished with a false bottom of carpet or canvas, in which two cross-slits are cut rather towards the back, will often suffice for an emergency. In America it is found that making the nests *dark*, as by placing them away from the wall and making the hens enter them by this dark passage from behind, the front towards the house being closed up, greatly prevents, and often checks egg-eating. But when it once occurs, the weight of American testimony inclines us to the egg or egg-shell cure.

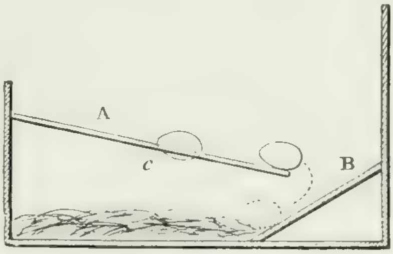


Fig. 29.—Safety Nest.

Shape and Size.

It is a tradition of ages, dating back at least to Horace (Lib. ii., Sat. 4) and Columella, that long, slender eggs will produce cocks, and rounder ones hens. These old fables have been refuted again and again; the fact is that nearly all of any hen's eggs are almost exactly alike, and can be known as hers. Strange coincidences have occurred from time to time; when we experimented, we had some too; but sooner or later these are upset by as flagrant contradictions. The little foundation there may appear for this superstition probably lies in the facts which we had ascertained and stated many years ago, that a pullet's early eggs are generally rather slimmer and more pointed, and on an average also produce rather more cocks, and that in less degree the same applies to hens' eggs as laid early in the season. Generally speaking, there are more cockerels in a brood the more vigorous the pen; hence cockerels usually preponderate in early broods, which are mostly from cockerels mated with adult hens.

We would certainly prefer, for sitting, to select eggs of the fair ordinary size and shape generally laid by any given hen, but this should not be pressed too far. Some Spanish and Minorcas lay all sorts of shapes, even as round as a tennis-ball, and we have known strong chicks from these and other rather exceptional eggs. Still, good average eggs with firm and smooth shells should certainly have the preference, rejecting unusually large ones quite as much as unusually small. Eggs from any hen being laid rather smaller, is generally a sign of insufficient feeding, and especially of insufficient nitrogenous food. If this be not at once remedied as soon as diminution in size is first observed, a stoppage of laying may probably come very soon, and it is not to be expected that such eggs, from insufficiently nourished birds, will prove vigorous in hatching, or the produce show much constitution afterwards.

Packing Eggs for Sitting.

Eggs are often purchased or sold for sitting purposes, and such sittings require a few words. All such eggs will, of course, be dated, and for reasons already given, this date should be upon the small end; moreover, this is the end which will be apparent when they are properly stored with the large end down. Careful packing is of course required, bedding loosely in bran being quite insufficient. Where it is obtainable, dry moss is amongst the best packing material, and if every egg be wrapped *loosely* in a wisp of paper, and then bedded carefully with a little moss between each, and an inch of the moss beneath and on top and all round, they will travel well. Either a box or basket may be employed, tying down the lid of the basket by aid of a packing needle, or cording or screwing down a box cover; for hammering nails should be avoided. People who sell many eggs usually have hampers made to a regular size and pattern for them. Soft hay or wood wool are nearly as good as dry moss, and used the same way, taking care to wrap the eggs loosely in their papers first, so as to leave corners and creases projecting; these are as important as the hay in preventing concussion. A hamper for a single layer of eggs should be about six inches deep, and the hay or moss should not be rammed in tightly, but loosely enough to leave plenty of spring in it. Fragile Bantam eggs are better wrapped in thin or even tissue paper, but still loosely, and bedded in wadding or cotton wool. We consider packing of this kind, either in box or basket, better than the small boxes with compartments for each egg, so far as regards eggs for sitting.

Resting Eggs.

Eggs carefully packed will hatch with perfect success, if they are properly treated, but this is not always the case. Wide and long experience has proved beyond any reasonable doubt that they do best if allowed to "rest" on their sides in a quiet and cool place for fifteen to twenty-four hours; the germ, already partly developed as we have seen, appears to be "fatigued" by the shaking of the journey, to require rest after it, and to benefit from such adequate repose before the new task of incubation. But on the other hand, if there be much delay beyond this, the interruption in its career appears somewhat prejudicial, even beyond the mere lapse of time, which we have seen is in itself detrimental to a perceptible extent. Anything of this kind is not fair to the vendor of the eggs, or favourable to the hopes of the purchaser.

Sitting-hens.

We are thus brought to the sitting-hen, on the supposition of the present chapter that the eggs are to be hatched in a natural way. She will either belong to the home stock, or be purchased or hired. Amongst the hens or pullets kept, much may be done to secure sitters in good time. Silkies and their crosses, especially with small or dwarf Cochins, are proverbial for their propensity to sit after laying a few eggs. But as the time approaches when a sitting-hen will be required, one or two of the layers known or presumed to be good sitters should be specially looked after, giving less nitrogenous and more carbonaceous food. A marked change of diet of this kind, in the case of birds that have been highly fed for eggs, has often great effect in this way. Again, each hen will probably resort to the same nest day after day; and while her own eggs are of course taken away, each day she lays one, another nest-egg should be left in the nest instead of it. This simple and natural procedure will in very many cases cause her to become "broody" when the nest gets pretty full. The signs of a hen being broody are well known generally, and consist in remaining longer on the nest, till she stays there altogether, and when she comes off walking about with feathers loose and ruffled, and "clucking" in the characteristic manner. As soon as she appears settled, she should be removed, if possible, to the perfectly clean nest prepared for her maternal duties. She will make no difficulty in settling there also, if a few nest-eggs be given her till the others are ready, or she be fit to be entrusted with them.

Such a hen should be above suspicion as regards vermin; if not, a home-kept hen also will have to be treated. But a borrowed or bought sitter should always be examined carefully, with, of course, turned-up sleeves. This may save very much trouble and otherwise inevitable loss, for strange hens are often literally swarming, and such a hen *cannot rear chickens*; they will gradually droop and be no good, even if they do not die. She may be too bad to risk at any price; but in most cases thorough dredging and working into her plumage of insect powder on two or three occasions, or using perhaps for the first the powdered sulphur treated with carbolic acid, as mentioned in a previous chapter, will make her free; or she may be fumigated as described in the final chapter of this work. Such a bird should not be placed on her own permanent nest, however, till she will pass muster, but in some other, to be afterwards purified.

Heat of the Sitting-hen.

Mr. J. L. Campbell, a well-known American incubator expert, found in the course of his earlier experiments, quite to his surprise, that the heat of the body of broody hens varied considerably. On introducing a clinical thermometer under the breast when on the nest, four hens gave readings of 98°, 102°, 103°, and 105°. After a fortnight, these figures had gone up several degrees. The results were equally noteworthy. The hens with the medium temperatures both made good hatches; but neither of the others hatched a chick, though all the eggs had chicks in them. Those under the 98° hen were not fully developed, though some were alive; those under the 105° hen were fully formed, but all dead. He tried the same two hens again and again; they had the same peculiarities in the main, and he never got one live chick from either. These facts suggest causes of failure other than bad nests, or bad sitting, or thunderstorms, and may make the use of a thermometer worth while in establishments where more than one or two hens are set in a season.

Moderate-sized cross-bred hens are usually good sitters. Old English Game are in the very first class, and so are Dorkings if not too heavy. Cochins, Brahmas, and other breeds with Asiatic blood, such as Plymouth Rocks and Wyandottes, make close sitters and good mothers for a few weeks, but as a rule leave their chickens earlier than the above. The very large heavy birds are apt to crush eggs and tread on chickens; for this reason Rocks and Wyandottes are preferable to Cochins and Brahmas. But we always did very well with the latter unless unusually large; two large hens we had, we invariably had bad luck with. Some people have a prejudice against trusting pullets in their first period of broodiness, but we never had the slightest cause to regret doing so, as we have done frequently, and early pullets are generally amongst the earliest sitters available.

Breaking-up Sitting-hens.

Of course, many hens become broody when it is impossible or undesirable to let them sit on eggs. In many cases, as before moult, it is advisable to let them have the rest of sitting upon nest-eggs for a while; but often it is desired to break them of the desire and obtain eggs again as soon as possible. In past days of ignorance hens have been dipped in cold water, with an idea of cooling the fever of the blood; such treatment, besides the risk of the chill, is really of little use. The proper plan is either to confine the bird under a common basket-coop or open wire pen, on the hard ground in the open yard, with water by her, and where all the others come round her, in full daylight but shaded from the sun, and feeding the corn for the whole about her coop; or, what is perhaps better still, placing her in a pen something like a fattening-pen, with a bottom of slats only. This may be either raised as usual, or only a few inches from the ground on four bricks; in either case she is obliged to roost on a slat, as it were, and is kept cool, while, as before, she should be in plenty of light (but not sun) and where she sees all that is going on. A few days of this cool confinement will suffice in nearly every case.

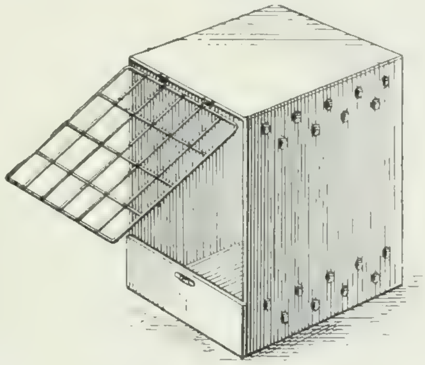


Fig. 30.—Nest-box.

The Hatching Nest.

A nest for hatching should be made up, if possible, on the ground, in a quiet and cool place, and if a little damp, all the better when spring has fairly set in. After trying many kinds, we preferred to all other nest-boxes the simple form shown in Fig. 30, tacked together of thin boards, entirely open at the bottom, and also in the front, except a strip about three inches high to confine the nest material. For our large Brahma hens the size on ground was about 16 by 12 inches, and the open front may or may not be provided with the hinged wire or other open front of some kind. Scrape a slight hollow in the ground within the box, or over which to place it, and further bank up the corners with a trowelful of loose earth or ashes. Over this place a suitable quantity of clean straw beaten and crushed till quite soft, forming a nice moderate hollow, and again well filling up the corners, so that eggs cannot roll away. In each corner put amongst the straw a small lump of camphor, which will do much to keep away insects. As a rule nothing more will be needed; but if the weather be persistently and unusually dry, or in a hot season, it is well during the last ten days of incubation to take some warm water in a kettle, and pour a few spoonfuls on, or rather into each of the corners of the nest. The object is not directly to wet the eggs, but that the moisture may descend underneath the straw, and create a moist atmosphere. We have formerly advised and practised taking the hen off at night and *sprinkling* the eggs with warm water in hot weather, but we long since satisfied ourselves that this was usually overdone, and often did mischief. Another good plan is to pour a teacupful of warm water on the ground close *round* the nest, in hot or dry weather. Any moistening at all should be restricted to this; in wet or cold weather none should be attempted. At such seasons, or for early broods, nests should be made with special care and with more straw; and if the ground be damp, it is better in winter to put in the nest first half a spadeful of clean dry ashes, which will do much to prevent chill.

Moisture

If a hen cannot be set on the ground, it is well to place, as the foundation of the nest, a good thick turf cut to fit the box, and well curled up at the corners by some earth put underneath, so as to form a basin for the straw. We thus have a foundation to which we can apply some moisture if required. In default of this, we think eggs thus hatched above ground are usually the better for a slight daily sprinkle in hot dry weather, during the latter half of the period. There can be no doubt, however, that at one period damping or sprinkling the eggs was much exaggerated, to actual harm and loss. Nature has provided sufficient moisture in normal circumstances, and we only have at the utmost to provide for any deficiency our nests may present, as against the situations which they would occupy were Nature free to take its course. The nearest approach we can make to this, is to damp the *substratum* of the nest when required.

It is best to set a hen at night, when she will rest quietly on the ground whilst the eggs are arranged, if shaded from the light of the lantern. Most hens, if then placed in front of the nest where they can see the eggs, will quietly walk right on and settle themselves. A strange hen should, if possible, be brought to her new quarters also at night, in a basket, with an egg or two under her. If sent by rail she should be left in a quiet place till dark, then removed to a nest; but not to the one she is to hatch in until her personal condition has been ascertained, as hinted above We rarely remember failure with strange hens when treated in this way.

The number of eggs set should be graduated to the hen, and the season; for very early broods, seven or eight of her own sized eggs are enough. If more are attempted, the outer ones may get chilled; but, still more, we have to consider how many chickens the hen can properly *brood* when they have somewhat grown; if she has too many, in cold weather the weaker ones will not get warmed, and are either stunted or may perish. At a time (long ago) when we sold eggs at a high price for sitting, we very soon came to a rule of not letting any person have more than ten at a time, and we found that the average results reported to us were better than with more, up to the middle of April. With warmer weather, of course, more can be allowed, but we think eleven enough, if they are known to hatch well. They should be arranged so as to lie in a moderate but not excessive hollow, just enough to keep them well together; but in cold weather the straw should be well raised around them. If not otherwise marked, every egg should be marked round with ink or pencil, as a hen may lay one or two after sitting, which should be removed.

Number of Eggs.

The management of the sitting-hen will depend much on circumstances. There may be but one or two broods in the year, and she may have to be set in the ordinary fowl-house. She should then have her usual nest, of course re-made for her, but should be secured from molestation by others, by having a square of wire netting or light lattice propped against the front when she is on the nest. She should be lifted off the nest at the same hour every morning, and fed in some way by herself, otherwise she will not get enough, and time will be lost. She must also have access to a dust-bath. Whole barley is the best food for a sitting-hen. She will rarely remain away more than half an hour, more often not that, if what she needs is at hand; and when the proper time is up may be gently driven or coaxed back to the neighbourhood of her nest; to catch her and replace by hand is to court disaster. A longer absence is not necessarily fatal, and it only does harm to be over-fidgety. We have repeatedly had hens absent over an hour and still bring off good broods, but much depends upon the

Management of the Sitting-hen.

weather, and period of incubation. A well-known writer has stated that "at the earlier periods of sitting the hen may be absent for a prolonged time without injury, whereas a much shorter neglect of her duties would be fatal nearer the day of hatching." Unless this statement be confined to the first ten or twelve hours, the exact contrary to it is the case, as testified by the uniform experience of thousands. It is during the first few days, up to the tenth day, that the eggs are most easily addled by chill; after that the chicken keeps up more and more heat by its own vitality, and is more independent accordingly. During the last week we have personally had a hen off nearly five hours, and still obtained a half brood; and in one case reported to us, five chickens survived even nine hours' neglect. However we feared the worst, therefore, we would never abandon valuable eggs until the full term and somewhat more was completed.

Another plan that may be recommended, where a number of broody hens are sitting together in the open, is to adopt the method that is widely in vogue among pheasant rearers in many parts of the country. We refer to "tethering." A stake is driven into the ground immediately in front of each coop or sitting box; to this stake a string, having a slip-knot at its unattached end, is tied. Commencing at the first coop in the row, the attendant takes out the hen, slips one of its legs through the loop at the end of the string, and leaves the bird to feed and water itself. By this method, it will be seen, that when the hen has to be replaced in its box the operation can be accomplished without loss of time and with the minimum of trouble.

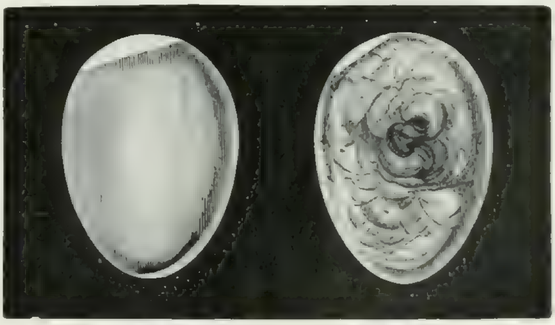
Many yards have a sitting-house, where several hens are set at once. In this case it is also safest to take them off, and see them return one at a time (always taking them in the same order), as two sitters often fight. They should always be seen safely back again when thus managed. But there is still another plan, which we followed with much comfort when using the building shown in Fig. 11. We used then to sit a single hen in one of the small pens marked D D. Hens may generally be left entirely to themselves in such single houses and runs, seeing only to the dust-bath, and food and water, and removing the daily evacuation. But some hens would never come off if so left, and we always preferred to remove them; in such small runs they never outstay the time, however, and may be left to themselves as to return.

Broken Eggs.

It is well to look every two or three days to see whether any eggs are broken. Should such an accident occur, the first night afterwards a bucket of water heated to 102° should be taken to the spot, and the hen being lifted off, every egg well cleansed in the pail, using a piece of flannel. All dirty straw must also be removed and the nest re-made, quite clean and comfortable. Should the hen's breast be soiled by the broken egg, that also must be cleansed thoroughly, or it may adhere to one of the eggs and so repeat the accident. If this treatment be neglected, hatching will probably fail altogether. Sometimes valuable eggs may get cracked within a few days of incubation; in many such cases the egg or chick has been saved by pasting over the crack a small strip of gummed paper, or, in the case of Bantam eggs, of goldbeater's skin. Cases of perforated metal large enough to contain an egg are sometimes used in such instances, and may be useful. We have seen another form, in some respects better, the metal being thinner and enamelled white, and furnished with small perforations all over. These egg-cases, or protectors, may also be used to contain insecticides or disinfectants.

Testing Eggs.

At the expiration of from six to eight days the eggs should be examined by candlelight, as the unfertile ones can then be easily detected, and if the greater part be sterile time is saved, as the same hen may be at once set again. A new-laid egg, as is well known, appears clear and translucent when held between the eye and a candle. Barren eggs appear so still (as shown in Fig. 31), even after being sat upon a week; but the eggs which contain embryo chickens then have a dark shadow in the centre, shading off to more transparency at the edges. The amount of shadow will vary with the time of incubation and size of the eggs, and perfect opacity will not be found till nine or ten days have elapsed, even with good-sized eggs; but after a few experiments, enclosing the egg



Figs. 31 and 32.—Testing Eggs.

Barren Egg. Fertile Egg.

between the thumb and forefinger, and turning the rest of the hand so as to shade the light as much as possible, no mistake will ever be made, and even with the hand alone, the quality will be determined with certainty. By using a plate of tin or zinc to shade the light, and holding the egg to an aperture in it, cut to the shape, the light may be brought closer. The egg-tester, shown in Fig. 33, is a very favourite form; in this the outer plate A is furnished with several movable diaphragms as at B, C, for different sizes of eggs, or such can be prepared to fit the eggs. With such an apparatus, besides the shadow in the centre some of the radiating blood-vessels can generally be distinguished, and after experience many breeders are able to pronounce upon the eggs by the fifth day, especially if a lamp be used which has a lens to condense the light, such as a really good bicycle lamp, which answers excellently. A hole may be cut in a book-cover or other sheet of thick card, and used in the same way. The sterile eggs up to eight or nine days are quite good enough for puddings, and if fresh when set, will be better than many "shop" eggs even for boiling; or they may be used as food for the chickens. A simple tester of this kind is as much as can be useful to persons who only hatch occasionally; a more powerful instrument for use on a large scale will be described in the next chapter.

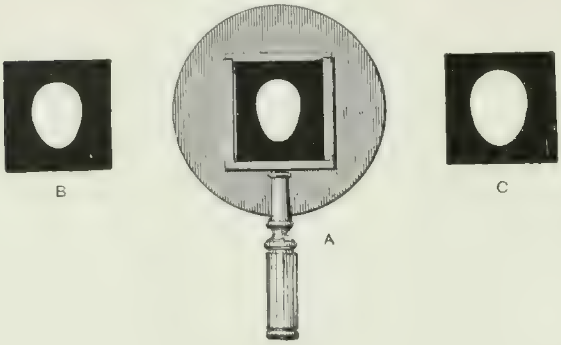


Fig. 33.—Hearson's Egg-tester.

Early in the season, when unfertile eggs are most likely to occur, it is a good plan to set, if possible, two hens simultaneously. Then the fertile ones, if many have to be rejected, can all be given to one hen, and the other set again. In any case, if the majority are unfertile, the waste of the sitting-hen may be avoided by ascertaining the fact thus early.

Period of Incubation.

It is usually taken for granted that eggs of ordinary poultry hatch "after twenty-one days," but this is not strictly true, and the actual time varies considerably. With fresh eggs of medium sized to large fowls, our own experience was that they usually hatched early in the twenty-first day, those not so fresh during the rest of it. Cold weather and east winds delay the time; warm weather rather hastens it. Small, light breeds like Hamburghs often hatch during the twentieth day, and Bantams sometimes during the nineteenth. Other varieties of poultry hatch as follows: ducks, twenty-eight days; geese, twenty-eight to thirty days; turkeys, twenty-six to twenty-nine days; guinea fowl, twenty-five to twenty-six days; pheasants and partridges, twenty-four to twenty-five days; pea-fowl, twenty-eight to thirty days. In incubators the time is still more variable.

Hatching.

A day before hatching is expected, many people like to immerse the eggs in a pail of water heated to about 105°. In a few minutes—they often wait a little first—the "live" ones will begin to bob about in a curious manner, from the motions of the chick within. If none at all respond, or if many of eggs previously "tested" fail to respond, it is better to restore them all, as hatching may perhaps be rather late. We believe such a soaking is of some help to the hatching; but unless the hen is quiet and tame she should not be fretted by such proceedings, nor is it very advisable for absolute novices to meddle with them.

The hen should not be fussed with very much whilst hatching. It should be seen that she has a good feed the last time she is expected off, then she is better left, except for visits at considerable intervals. If she was set at night, some will probably have hatched by the afternoon, if so let these egg-shells be cleared away. Then, the last thing we would examine again, removing any further shells, and if the hen was tame give her some food as she was. Then she can be shut in, *dark*, till next morning. If there are known to be live chicks, however, and no progress seems made when they are more than due, or if eggs are "starred" and things seem no more forward after some hours, the chicks may be glued to the shell by dried albumen, or too weakly to get farther. In that case they can often be assisted out, immersing the egg (all but the head of the chick) in warm water about 105°, gently enlarging the crack, and possibly peeling tenderly away the wet membrane. All must, of course, be performed as if dealing with raw flesh. Chicks thus assisted out of the shell are generally best kept in flannel by the fire till night, when they should be put amongst the others under the hen. Many such chickens have survived to make perfectly healthy fowls.

CHAPTER V.

ARTIFICIAL INCUBATION.

SINCE the first edition of this work, a revolution has taken place in the practice of artificial incubation, so great that not one machine then described now receives more than historical mention in these pages. It is difficult to understand the slow progress in the art made during many years, or all the precise causes to which the years of failure or uncertainty were due, all the more when we remember that for at least two thousand years artificial incubation has been practised in both Egypt and China, with the simplest appliances, but with unvarying success. From a report by the American Consul at Cairo, published in 1895, there appears to have been a revival in Egypt of this pursuit, which at one time had fallen to a comparatively low ebb. He estimated at that date the probable number of egg ovens as about 150, each of them turning out on an average about 300,000 chickens per season, hatched during the months of February, March, and April: some having less capacity, and others running up to double the average number. They are situated in villages which form centres of agricultural districts, from which the eggs are brought in, to be taken away again as chickens at two days old. In some cases a fee is paid for hatching, but as a rule the eggs are bought outright for about sixteen shillings per thousand, and sold independently as newly hatched chicks for about six shillings per hundred.

Egyptian Egg Ovens.

The crude simplicity of these great incubators is striking. One of them will occupy a ground plan of say 100 by 60 feet, and is constructed massively of sun-dried brick and clay. The end will be occupied by two or three small halls or vestibule rooms, which guard the temperature from the effects of opened doors. From a second one of these, a small door leads to a passage-way up the centre of the building. From this central passage, small entrances on each side lead to double-storeyed circular rooms or vaults. These are about sixteen feet in diameter, the lower storey four feet high, the upper one nearly double. Round the floor of each, ten inches or so from the wall, runs a low wall or ridge about six inches high; in the trough between this and the wall portions of fuel (composed of straw and dried dung) are placed, and fires lighted, more or less in number as the heat requires increasing or lowering. The operator stands in the centre, reaching the upper storey through a hole in the centre of its floor, and changes the position of the eggs, which are laid on matting covered over with bran, twice a day, from near the man-hole to the circumference, or *vice versâ*. Small apertures at the top of each chamber let out the smoke and superfluous heat. The eggs are tested much as we do, at about the sixth and the tenth day, and the newly hatched chicks are placed till sold in a portion of the central passage, which is rather cooler than the ovens, and serves as a drying box. The apertures or entrances to the ovens themselves, are closed and caulked every time when the attendant withdraws.

Thus simple is the Egyptian oven-incubator, and so entirely is its management left to the attendants. No copper tanks have they; no water-trays to temper the "hot dry air"; no thermometer do they know anything about; *but they hatch chickens*, and that without dreaming of failure. On the other hand it is to be remembered that the profession is hereditary, handed down with its cherished secrets under solemn oaths and initiatory rites from father to son. We need not set much store by the oaths; but there is no doubt that experience and heredity have developed an extraordinary sense of touch, by which alone the operators regulate the temperature, under constant personal observation, and after the first fortnight know instantly whether an egg be alive. It cannot fail to be noticed how their methods, now that these are better known, run flatly contrary to more than one principle which has for years been assumed to be vital in artificial incubation.

Our historical notes must be very brief, and confined to important points. All the earlier attempts at artificial incubation were made in France, whose monarch, Francis I., became

Early Attempts in Europe.

interested in the subject as far back as 1540. In 1777, Dr. Bonnemain constructed his "Eccalobion," which actually supplied chickens to the Paris markets, as well as to the Court, until all came to an end with the events of 1814. Réaumur obtained fair results from the heat of fermenting dung, heaped up round small casks, and renewed as required. In 1845, M. Vallée, poultry superintendent of the far-famed Jardin des Plantes at Paris, constructed an incubator which marks an epoch, containing as it did a self-acting valve which opened to reduce the temperature when too high. Its action was crude and imperfect, but he thus introduced a cardinal feature which is part of every incubator at the present day. In or about 1846, Cantelo introduced the supply of heat from above. His apparatus hatched many chickens, and was often exhibited, but was too costly to come into general use; and the same may be said of the large and elaborate incubator of Minasi, which was publicly exhibited in England, and used by one or two purchasers, so late as the publication in 1872 of the first edition of this work. With these the older group of machines may be said to come to a close.

Pioneer Incubators.

There followed another school of experimenters, whose aim was to produce machines more generally useful, and accessible, and portable. Carbonnier's incubator consisted merely of a rectangular tank of water heated, without flues, by a lamp placed in a chamber at one end. Under this was a drawer in which the eggs were placed, covered over by a canvas resting upon them, on which was borne half an inch of sawdust. In the tank was one thermometer, and in the drawer another, and the whole was regulated simply by incessant watchfulness. He laid down specifically that once a day the eggs were to be withdrawn, to be cooled for twenty minutes, then turned over, and the sawdust replaced upon them and sprinkled with tepid water. Many made this simple machine, and some hatched well with it, but the time and care needed were far too great. We have often wondered that a heating medium gently resting upon the eggs, like his layer of slightly damped sawdust spread upon a canvas, has not been more frequently attempted.

Brindley's incubator, introduced in 1866, consisted of flues from a boiler circulating between an upper and lower pane of glass, which formed a radiating hot chamber, thus introducing another system much used since. Under this radiating chamber was a drawer of felt, in which the eggs were placed. There was a regulating valve, which let hot air out from the chamber when required, but it did not act very well, depending as it did upon the expansion of mercury. This machine was at one time used by several British fanciers to do the final hatching-out of eggs previously incubated by hens. In 1865 Mr. F. Schröder introduced for the first time a tank of cold water under the eggs, whose evaporation provided moisture, while the heat came from a hot-water tank above. In 1866, Col. Stuart Wortley introduced the principle of warming a hot-air chamber by introducing a greater or less length of water pipes always kept *boiling* hot, and passed through stuffing-boxes; but this principle has never come into use. It is rather remarkable that, although Schröder's incubator was surrounded by curtains, none of these machines were otherwise provided with a case of non-conducting material, so important for economy of fuel and uniformity of temperature.

Two other English incubators of the experimental period demand record for the originality of their arrangements. In that of Mr. Penman, of Newcastle, the bottom of the hot-water tank was formed of vulcanised rubber fabric, which rested loosely upon the eggs. After a while this material "bagged" too much, when the weight of the water was found to crush the eggs and chickens, and the method was consequently given up. We knew this incubator to hatch well on several occasions, however, and the defect stated could so easily be remedied, that we have often wondered no further attempt was made to carry out this *top contact* system, along with more perfect modern appliances.

In the incubator of Mr. Boyle, top heat was also used, but not quite in contact. The hot-water tank P, supplied by the pipe Q, was shaped at the bottom into a series of arches,

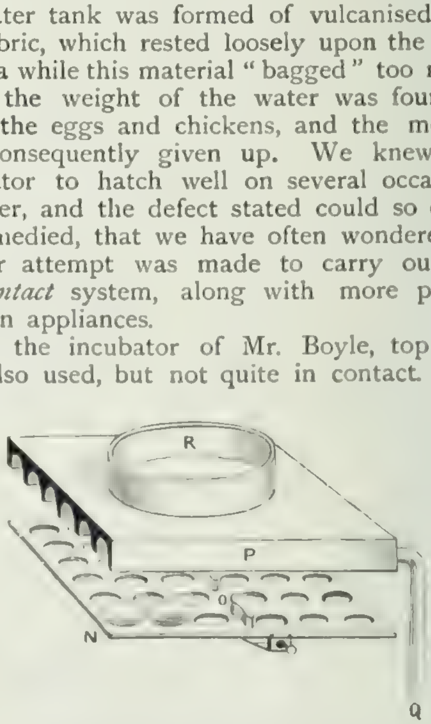


Fig. 34.—Boyle's Incubator.

as shown at the left hand of the figure (the top ring R being a drying box for the chickens). The eggs were placed in rows in the apertures of a perforated plate, N, so that when pushed into place the rows of eggs were almost touching, and enveloped by, these arches. At O were small receptacles for holding wetted cotton wool. The bottom of the plate and eggs in it were exposed to the air. With this system of top heat, and the bottom sides of the eggs cool, it was found that the requisite temperature was about 106°, whereas in a drawer warm all through it is about 103°. This distinction is important, as will presently be seen. The arrangement was, however, awkward in practice, breaking eggs wholesale in sliding the egg-plate in and out; and though Boyle's machine hatched well on many occasions, it never came into general use.

American incubators, during the same transition period, had more general similarity in design. Patents were taken out by dozens, but we can find little of value. In 1870 Jacob Graves and Co., of Boston, introduced an incubator whose type lasted many years, and did much work. It embodied Schröder's cold-water tank under the eggs, with a hot-water tank over them, and a chicken nursery or drying box on top of all; and its regulator acted by the expansion of alcohol in two large tubes extending through the egg-chamber (see Fig. 36). Mr. Halsted introduced an arrangement of flues through the tank which tended to make the water rather hotter round the edges than at the centre, thus counteracting the too great heat in centre of the egg-drawer, which was and is still found a general defect. He also introduced the regulator whose type is mercury expanding by heat, and so overbalancing a lever and working a valve (Fig. 37). This being faulty, he abandoned it for a compound thermostatic bar, and with this and some other modifications, his machine had a sale during many years as the Centennial. The most original idea we have come across in older American machines was that of Mr. E. S. Renwick, whose system radically differed from others in not attempting to keep the temperature uniform, but aiming rather, after maintaining it at a *minimum* for some hours, then to raise it to a *maximum* of about three degrees higher. This was done by a clockwork arrangement. There is no doubt that this remarkable machine hatched well, but it was too complicated and costly for popularity. So far as we are personally aware, the same inventor seems the first to have formed the bottom of the egg-drawer of rollers, by whose revolution the entire drawerful of eggs could be "turned" at one time. Those here mentioned were all tank machines, which prevailed for many years as in England; only by degrees being manifested that preference for the hot-air system which distinguishes the best American machines of the present day.

Such was the state of affairs at the commencement of the last quarter of the nineteenth century. The prominent importance of uniform temperature (for even Mr. Renwick's systematically varied temperature was to be within defined uniform limits) had been recognised; but that object had not been really attained by the regulators then in use. Some of these, especially in America, had been carried to the extreme of elaboration and apparent efficacy; still they failed to do their work. That moisture and ventilation also played an important part was known, but not well understood, nor especially the relation between them; and there is no doubt that some of these older incubators would give good hatches now, handled with the knowledge since acquired respecting these latter points. What artificial hatching was done was chiefly in America; where the popularity of Leghorns and broiler chickens made it more necessary, where the number of incubators produced skilled operators, and where regulators on an average surpassed English models, though still leaving a great deal to be desired in their operations.

The Hydro-Incubator.

Strange to say, artificial incubation became a practical reality in England owing to the introduction by Mr. T. Christy, in 1877, of a machine of the rudest construction, known as the Hydro-Incubator, made upon a model already successfully used in France. The heater was a large rectangular tank of water, from the upper portion of which was withdrawn every twelve hours a certain number of gallons (variable according to the thermometer indications), to be replaced by boiling water, thus keeping up the temperature. Under this tank was the egg-drawer, provided with arrangements for damping and apertures for ventilation, the whole being surrounded by non-conducting material. There was a thermometer in the tank and another in the egg-drawer; literally nothing else.

When so many had vainly devoted money, pains, and complicated apparatus to maintaining a uniform supply of heat, that a simple machine should succeed which depended altogether upon a re-supply of boiling water every twelve hours, appeared to all simply ridiculous, and it was some time before it was understood why it was that such success had attended so rude a contrivance. Mr. Christy himself thought the reason to be that there were no lamp-fumes near the eggs, an idea long since exploded by machines which admit such fumes directly into the egg-chamber. The secret really lay in two points. In the first place, the hot-water tank was *very large* compared with apparatus previously made, holding for a 100-egg machine about twenty or twenty-four gallons. The enormous "specific heat" of water makes a large body of it very "steady" in temperature. But the construction of the tank was also peculiar. If we take a flask of water containing a few particles of bran, and apply a lamp to the bottom, we shall see how the heated water rises and circulates, and the whole becomes quite hot in a very short time. But if we apply a hot plate to the surface of the water in an open glass vessel, there is scarcely any movement, and it is a long time ere the heat reaches the lower portion of the fluid. This time may be increased still further by horizontal partitions, which compel the hot water to take a roundabout course. The tank in the hydro-incubator was not only large, but furnished with such partitions; and the boiling water was always supplied at the top. Thus the heat percolated very slowly downwards; and while the water drawn off (from three to six gallons) was generally about 146°, and replaced by water at 212°, the temperature of the *bottom* layer, which acts upon the eggs, only varied in a small degree, and that in a regular manner within certain limits, which might be actually beneficial to the eggs, according to Renwick's theory above mentioned.

Hydro-incubators were sold by scores, and artificial hatching in England became at once a practical success. With this, valuable experience was rapidly accumulated, followed by improvements in details of management. Its work being done, however, the hydro-incubator itself only remained in use for a few years. Simple as the system was, the provision of gallons of boiling water every twelve hours was found such a tax, that there was a demand on all sides for supplementary apparatus. The further step was soon taken of carrying circulating pipes from a small boiler into the tank of the machine; and instead of replacing from three to six gallons by boiling water, every twelve hours, at the same periods, the lamp under the boiler was lit for a short time. Finally, however, manufacturers have returned to the old system of employing the constant heat of a lamp.

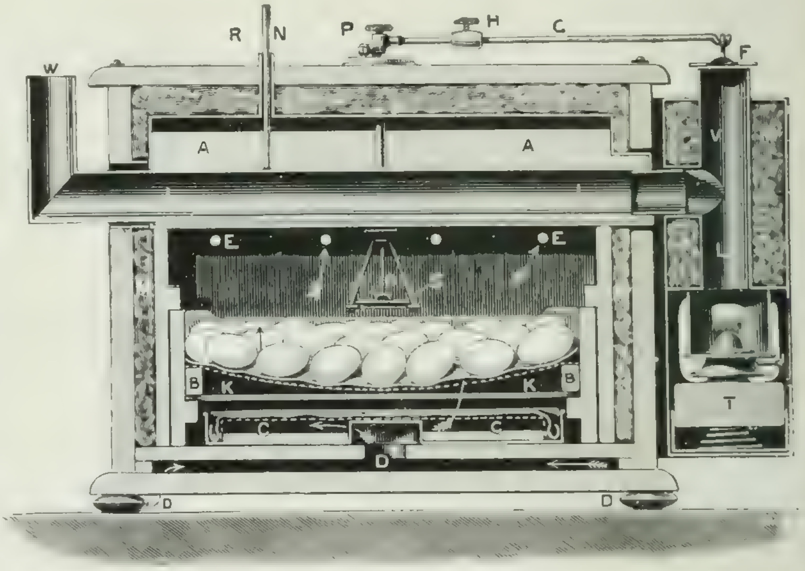


Fig. 35.—A Tank Incubator (Hearson's Pattern)

Hearson's Incubator and Capsule Regulator.

The incubators now in use are constructed upon two systems, known as the "tank," and "hot-air" or "atmospheric" systems. In England the tank system has generally prevailed, owing partly to the sudden success of the hydro system above described, but more recently to the excellent results of the incubator and regulator patented by Mr. Hearson in November, 1881. The earlier tank machines were made with large tanks, often with horizontal partitions on the hydro-incubator plan, which "steadied" the temperature, and gave fair results with very mediocre regulators; the regulator in Tomlinson's machine, for instance, acted by the expansion of heated air. With better regulators, smaller tanks sufficed; and in fact Mr. Hearson somewhat reduced the depth of his tanks as experience was gained. The present form of this machine is shown in Fig. 35. The tank A A, which is not intended to be kept quite full, is traversed by the flue L L from the lamp T. This flue is shown for clearness leaving the machine at W, at the end opposite the lamp, but really returns to the same end before emerging. The top of the lamp-flue or chimney V is covered by the valve or damper F, so that when this is closed the heat enters from the lower end L of the chimney, and the whole traverses the flue L L to the exit W; but when the damper F is raised, more or less heat escapes, and if fully raised nearly all the heat escapes at F, none going to heat the tank. This arrangement is worked by the thermostatic capsule S, the main subject of Mr. Hearson's patent, which depends for its action upon the boiling-point of a volatile liquid. As water boils at 212° F., so sulphuric ether boils at 94°, and by dilution with alcohol can be made to boil at 98°, or any other temperature. The capsule regulator consists of two plates of brass fastened and soldered all round their edges. Between them a little of the modified liquid, which may conveniently be termed compensated ether, is introduced, and the capsule sealed. Then directly the supposed heat of 98° is exceeded, at atmospheric pressure, the flattish capsule expands or bulges under the pressure of the vapour which is formed; but the boiling temperature is easily increased and graduated by pressure upon the top plate of the capsule; hence we have an easily adjustable regulator. The capsule lies on a little shelf rigidly braced in a position over the eggs and below the tank, and a rod O pressing upon its top plate transmits the expansive motion to P, near the pivot end of the lever G, where there is an adjusting screw P; there is also on the lever a sliding weight H. By this screw and weight the temperature which lifts the valve F is adjusted. In practice the valve should "play" a little above the top of the chimney. The body of the incubator is packed around with non-conducting material M. The movable egg-tray K K has a bottom of perforated zinc, and is concave, so as to bring the outer eggs, which are in a cooler part of the chamber, nearer the top tank. The strips B B supporting the tray, are also movable, and being wider one way than the other, by changing their position the tray can be somewhat raised or lowered in the chamber. The air enters through the aperture D, passing through a coarse fabric kept wet by dipping into the water-tray C C, and passes out through the upper ventilating holes E E.

Other English Tank Machines.

The incubator here figured is still a deserved favourite, and may well be allowed to stand as the type of the many excellent British tank machines, such as those of Messrs. Tamlin, Phipps, and other well-known makers. An interesting variation is that of Mr. William Lea, in whose "Triumph" incubator the heat is supplied by circulating pipes from a small outside boiler, the inside tank being dispensed with. The principle in all is much the same; some makers employ larger hot-air flues, in which one of them introduces baffles or partial stops, in order to check the rate of draught and economise oil. Some employ deeper tanks to steady the temperature, and make the bottom of the tank concave towards the egg-tray, in order to diminish the inequality between the temperature at the centre and the outer margins. To equalise the heat over all the eggs is one chief difficulty in all machines, heat being lost by radiation from the margins of the chamber, however carefully packed. The amount thus radiated, and consequent inequality, will vary with the arrangements, and the ventilation of the machine, and the temperature outside; and provision against it can only be averaged. One inventor carries his hot-air flue round the edges of the tank; another brings the hot-water down a few inches below the main body of the tank, all round the egg-chamber. It will be seen that alteration in one detail may alter other conditions not intended, and that some good point may be gained at the cost of others. This is illustrated by such a simple matter as the cubic contents of the tank. The effect of increasing it has already been mentioned, in greater *steadiness* of temperature, thus masking or diminishing the effect of inefficient regulators. On the other hand the Hearson machine uses smaller tanks than at first, the effect of which is that the regulator responds more *quickly* to sudden changes in outside temperature, which a large tank cannot readily do. Hence, while a small tank may be regulated by shutting out or otherwise diminishing the supply of heat, a large-tank machine may require, in addition, to let out hot air from the egg-chamber through a valve. Attempt has been made to improve the capsule regulator itself in various ways, chiefly in regard to the small amount of the original motion, which has to be multiplied by the long lever. Various ingenious but misguided theorists have supposed that by introducing additional levers, or eccentric cams, into the mechanical part of the apparatus, they improve this state of things. Any person acquainted with mechanics will see that any such complications are the reverse of improvements, introducing needless friction at all the additional parts, with absolutely no gain, and that one simple lever working on a knife-edge is the best possible arrangement that can be adopted.

Incubator Regulators.

There can be no doubt that the success of Hearson's machine and others on similar lines was greatly due to the simple and effective action of the capsule regulator, and it may be well to describe here, before going farther, some of the principal types of thermostats which have been employed in incubator work. One of the first to work efficiently was that of Jacob Graves.

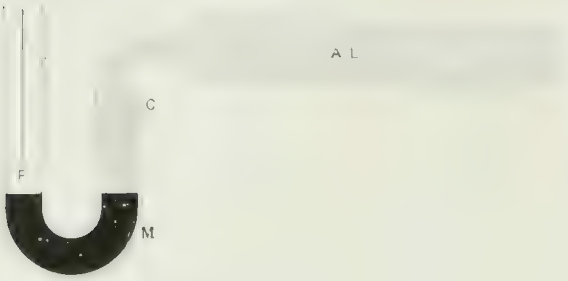


Fig. 36.—Graves' Regulator.

Here a large bulb or tube A L (Fig. 36) extending all along over the eggs in the chamber, was connected by a neck-cork C with the tube M. The tube A L was filled with alcohol, which expands greatly when heated; M was partially filled with mercury, carrying the float or piston F, which worked the lamp and valve, as it was pushed by the expanding alcohol up the tube. This regulator has been revived quite recently; a practically similar one being used in the American "Reliable" tank incubator of the present day.

Mr. Halsted introduced the "balancing" mercury regulator (Fig. 37). In this the bulb M on the end of a sealed tube T was large enough to hold about half a pound of mercury, of which sufficient was introduced to extend to about the shaded portion at 100°, the whole then balancing on the axis A A. On the heat increasing the mercury extended up the tube, when T descended, the turning axis A A working the valve. The whole was regulated and balanced by the weight W, sliding on an arm L fixed to the axis. This form was found awkward and cumbrous, and regulation poor, while breakage of the bulb was frequent; but the balance principle has been modified and used in many ways. In the best examples, the balancing *weight* of the mercury

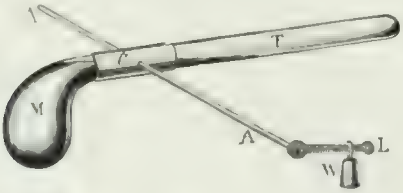


Fig. 37.—Halsted's Regulator.

is used in combination with the *expansion* of much more sensitive liquids. One of the most beautiful, sensitive, and really efficient balance-regulators ever designed, Mr. Boyle's, is shown in Fig. 38. The long limb A of a siphon-tube was in connection by the pipe B with the hot water in the tank, which in his machine was the medium regulated, the water extending nearly to the bottom of the siphon: in modern machines A would be connected with a long bulb-tube in the drawer, precisely as in Fig. 36, and might be filled with either water or alcohol. C is filled with mercury, and connected by the rubber-tube D with the small horizontal tube E ending in a cup F, all which also contain mercury. It will be seen that the expansion in and behind A forces more mercury into the cup F, and as the tube E is ten or twelve inches long, and turns on D as a pivot, the increased weight is added solely at the point where its leverage is most powerful. The motion can be utilised in any way by a thread or wire at M, and the cup is connected with a lever H K, pivoted on I, by which the action is balanced and regulated through the sliding weight L. This regulator works with a variation of one-tenth of a degree: it is in fact so sensitive, that it is advisable to steady it somewhat by connection with a balancing spring G. On its own machine it was quite thrown away; but we know as the result of experiments in other branches of biological study, that it is one of the most perfect regulators in action of any that have been devised, and have often wondered that it has not been applied to modern incubators, for some of which it is well adapted.

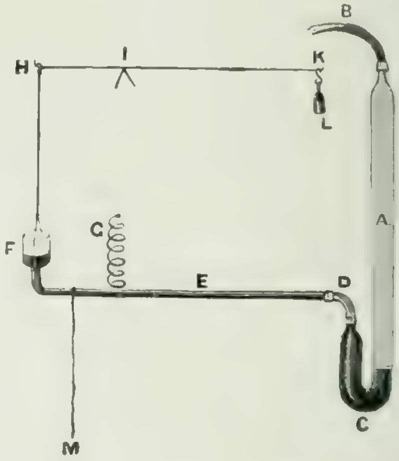


Fig. 38.—Boyle's Regulator.

The expansion of mercury has also been used to complete a battery circuit in what are called "electric" regulators. We would warn the reader to avoid all such, though the idea seems to have fascinated a large number of inventors. They are very sensitive in a way —almost hyper-sensitive in fact, to a certain extent—but their radical defect is, that when the circuit is completed it *is* completed: there is no gradation about it. We have seen many such devices, but this defect affects them all.

After Mr. Hearson's patent was published, mercury was much used in combination with a portion of compensated ether, to be vaporised as in his capsule; and though all these are practically now abandoned by manufacturers, they are so easily made up by amateurs, or may be so useful in an unforeseen emergency to anyone who can work a little in glass, that it may be well to describe the three principal types. In the **J**-tube form (Fig. 39) a small bubble of air B and a portion of ether E were introduced into the shorter and sealed arm of a **J**-tube, the rest being filled with mercury to the point F, where a float carried the rod R. At the proper temperature the vapour depressed the mercury to about the point A, raising the rod R. There were also several on the balance principle, of which Fig. 40 is a type, the tube here being bent into three-fourths of a circle and balanced on the disc D, to which the rod R is connected. The ether E is at the sealed end as before, and as the mercury is pushed round the tube it causes the disc D to revolve. In another form (Fig. 41), the sealed tube itself is made the float, being inverted in an outer tube or vessel also containing mercury. The bubble B and ether E are as before; the expanding vapour depresses the mercury M, and raises the inner tube, which bears the rod R. As already hinted, all these have generally disappeared, and there is no question that, of all thermostats depending upon the vaporisation of compensated ether, Mr. Hearson's capsule is far the best. Its simplicity, permanence, and the definiteness of its zero-point under the same conditions, all make it superior to mercury forms; and since the expiry of the patent it has been adopted by most English makers, and is made and sold, like thermometers, for supply to manufacturers generally.

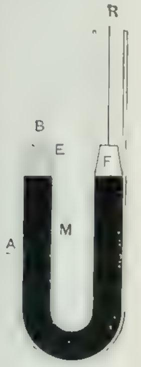


Fig. 39.

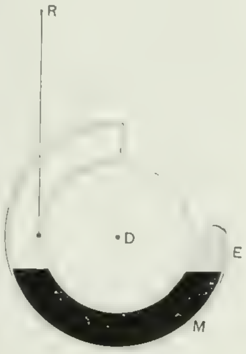


Fig. 40.

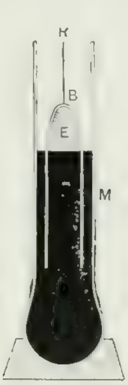


Fig. 41.

Nevertheless, this regulator (with all which depend upon vaporisation of a liquid) has one serious defect, which makes it quite unsafe to depend upon its automatic action alone. The point at which vapour is formed *differs with the atmospheric pressure*, to the extent in our compensated ether of about two degrees Fahrenheit for every inch of the barometer, or one thousand feet of altitude. As in England the barometer often varies to the extent of an inch and a half, less frequently to within two inches, and on rare occasions even more, it follows that the capsule may vary the regulation, from this cause alone and *independent of the temperature in the drawer*, by as much as three or four degrees.

Metallic thermostatic bars, when really efficient, act well and are free from this defect; but many have not been efficient. If two bars of different metals are fastened together side by side, and one metal expands more than the other, the double bar must, when heated, be forced into a curve, with the more expansible metal outwards; then if one end be rigidly fixed, the other will move, and may be used to work the regulator. This has been the most general construction; some wind the double bar into a spiral, which winds and unwinds as the temperature varies: Christy's incubator has a spiral thermostat of this kind. Ebonite has also been used as one of the components, and acts strongly, but is to be avoided because it gradually "perishes." Metallic thermostatic bars have been almost neglected in England, chiefly on the ground of the metals rusting. This objection is of course more serious in machines where copious moisture is used, and has been less felt where it is abandoned or used sparingly; but even in a moist chamber the difficulty is easily overcome. The Prairie State Incubator Co. surmounted this real trouble entirely in the case of their thermostats, which are composed of iron and hard brass (perhaps the most susceptible to rust of all metals), by tinning both metals separately before they are put together, and dipping the bars again into a bath of melted tin after they are riveted together. American patents are numerous; but we have not found very much of note, and will content ourselves with showing, in Fig. 42, that used in the now well-known "Cyphers" incubator. Each thermostatic bar F, of which there are two, is about twenty-four inches long (or the whole width of the chamber) and composed of a strip of steel with its two edges bent downwards at right angles: this is to make the steel rigid, and enable it to resist all bending strains. To the ends of the steel are firmly riveted, on both the upper and under sides, strips of aluminium, which expands more than the steel when heated. The aluminium is kept flat down to the steel for a certain distance from the ends by *sliding* ties or rivets, which allow it to slide along, but not to rise; thus the expansion is all thrown towards the centre, where the aluminium is not tied, and rises into a bow. The action, therefore, consists of four of these bows expanding with the heat, and the superiority of this thermostat consists in the strength and definiteness of the motion, and rigidity of the whole, just as in the capsule regulator. For the rest, the point of resistance is the nut B at the end of the rod J, the uppermost aluminium bow G lifts the tube C, sliding on the rod J and through the casting A. The motion is thus conveyed to knife-edges lifting the lever H with its valve E, the lever also working on knife-edges at I, and furnished at the other end with an adjusting weight D.

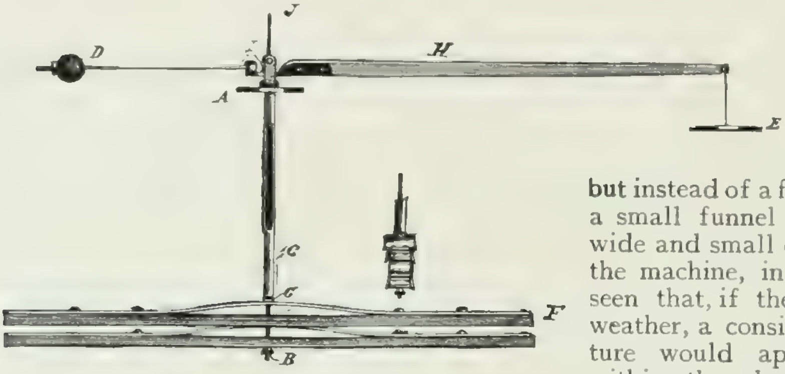


Fig. 42.—Cyphers Thermostat.

Double Thermostats.

There is yet another point in regard to heat-regulation. In some machines the egg-chamber is kept nearly uniform in temperature all over. But in others, which have a colder bottom, with the heat radiated from the top, the temperature differs greatly at various distances from the radiator, and hence must be *higher* above the eggs, in proportion as it is colder *below* them or in the outer air, to keep the egg itself at the same temperature. By many experiments, Mr. Hearson found that with his machine, the heat shown by the thermometer needed to be increased one degree for about every ten degrees fall of outer temperature; and this he directs to be regulated for by the sliding weight. Every machine of the top-heat type would have its own scale.

It is possible to provide for this automatically, though we only know at present of two actual attempts in this direction. The "Prairie State" incubator is now made with a ⊃-shaped thermostatic bar, one limb of the ⊃ placed above and the other under the eggs, and so combined in their operation as to give a higher temperature above the eggs when it is colder below. The result, we believe, is very satisfactory. The other example is English, in the regulator of the "Forester" machine. This is an ether-vapour regulator; but instead of a flat capsule, it is constructed like a small funnel (Fig. 43), closed at both the wide and small ends. The wide end is outside the machine, in the open air; and it will be seen that, if the regulator were set for cold weather, a considerable rise in outer temperature would appreciably diminish the heat within the chamber which was required to vaporise the fluid.

Hot-air Incubators.

We must now pass to a consideration of the "hot-air" incubator, and here, as with the "tank" machine, for purposes of brevity we may well let one standard type suffice. It is American, and has achieved deserved popularity, and claims, with undoubted success, to *entirely dispense with moisture* in hatching, in any situation or climate. It is due to long scientific investigation of all the phenomena of hatching by Mr. Charles A. Cyphers, and the master-patent under which it is made (December 4, 1894) is shown in Fig. 44. Here A A are the walls of an egg-chamber B, and these walls are all composed of a good thickness of *porous material*. Mr. Cyphers has successfully used wool or cotton compressed between sheets of wire gauze, and slabs of plaster of Paris, but prefers a manufactured material known in the United States as "fibre stock," composed of vegetable fibre, ground, pressed and dried, which makes up readily into suitable walls. In the diagram the whole surrounding walls are shown

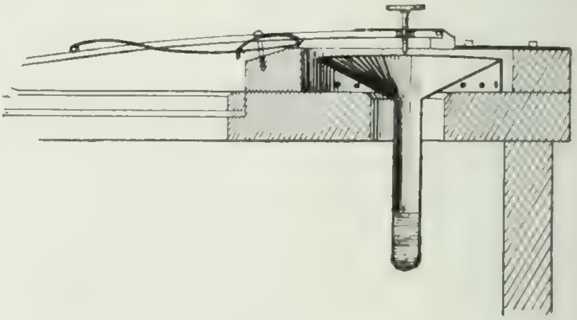


Fig. 43.—"Forester" Regulator.

of such material, while *e e* is a tray for the eggs, and the whole is warmed by pipes *d d* from a boiler C.

Whatever it may have been in the experimental stage, however, the "Cyphers" incubator is not now thus constructed. The porous material now forms only the entire upper and under walls of the egg-chamber. There is no boiler, but the lamp-heat passes up the inside and down the outside of a hot-air chamber. From this the pure, warm air passes into a heating chamber above the upper porous diaphragm, where it is uniformly diffused before passing through the porous material into the chamber beneath. It passes downwards through the eggs, and then through the lower (double) porous diaphragm, into another chamber at the bottom, from whence it is sucked by the draught of the heater. The ventilation is thus sufficient and steady, but quite free from draught, and very slow—what Mr. Cyphers calls a purely "molecular" ventilation—and the difference between upper and lower temperature is very small. The regulator is the excellent thermostat shown in Fig. 42, which keeps the temperature within a variation of half a degree. That the machine does hatch high averages, in large numbers, in all situations, without moisture, is proved by a mass of testimony beyond question.

In America there are other excellent hot-air machines, particulars of which, as Mr. Lewis Wright explained in a previous edition, it is not easy to obtain, manufacturers possibly amongst so mechanical a people having a well-founded dread of publishing working details.

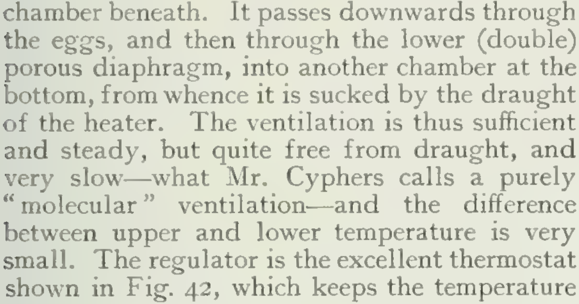


Fig. 44.—Principle of Cyphers' Incubator.

Of British "hot-air" machines, at the present time possibly the best-known is "The Gloucester," made by The Incubator Components Co., Gloucester, a good example of a self-ventilating and regulating non-moisture machine. There are also several inexpensive sub-types, the simplest of all being that in which a lamp is placed underneath, or in, the egg-chamber, as in the "Cosy Coop" (Fig. 45), and more or less of the products of combustion actually pass into the latter, besides more or less of pure heated air. It has been stated that passing heat direct from the lamp into an incubator is now quite discarded, because "the carbonic acid from the lamp is as injurious to the developing chick as it would be to human beings." Such a statement betrays ignorance; for it is well known to physiologists that although oxygen is necessary for animal life, the lower the form of life (such as that of the embryo in the egg) the *less* oxygen is required. Nevertheless, we shared a strong prejudice against this type of machine until we were convinced by ample evidence that in many hands it hatched most satisfactorily. Of course, it is necessary for sufficient fresh air to enter as well as the lamp fumes. But under such conditions machines do hatch successfully; they are also very useful for early experiments, and may introduce some people at small expense into a fascinating branch of poultry culture, which may perhaps be extended thereafter.

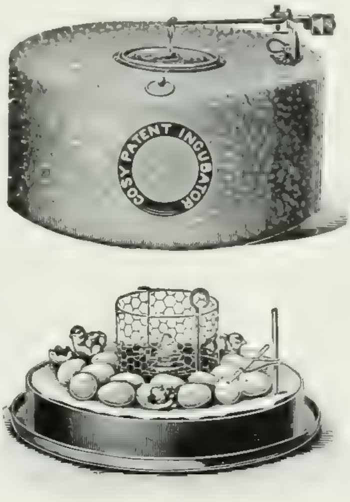


Fig. 45.—Cosy Coop Incubator.

A Comparison.

We may here pass to a comparison of the tank machine and the hot-air or atmospheric type of incubator. And the following excerpt from that practical handbook, "Incubation, Natural and Artificial," by J. H. Sutcliffe, published by *The Feathered World*, London, is given as being among the most lucid expositions of the subject. Mr. Sutcliffe says: "There are two distinct types of incubators, namely, hot-air and hot-water. In the former the air is heated in a heater outside before it passes into the incubator, or the air is heated by radiation from hot flues or a reservoir in the upper part of the egg-chamber. In the other case a tank of water is heated by means of flues passing through it, or part of the tank itself extends outside the incubator case to a boiler round the lamp flame by means of which a circulation is set up of heated water from, and cooler water to, the boiler. Radiation downwards from the tank heats the air in the egg-chamber. Both methods are therefore in effect the same, and both are really hot-air incubators.

"There are, however, important differences in the method of ventilation and in maintaining humidity in the egg-chamber. In incubators with hot-water tanks filling the upper part of the case the cold air enters and rises from below, and is heated by radiation as it rises. As the temperature of the egg-chamber is kept stationary at 104° by the rise or fall of the temperature of the tank, the volume of air passing through the fixed inlets and outlets varies with the temperature and density of the outer air; the colder the latter is the more air passes through the incubator, and the warmer the less air. For instance, if the outer temperature were to rise so high as 104°, there would be no change or passage of air through the incubator at all, as the air inside would be of the same density (being of the same temperature) as the air outside. On the contrary, at freezing point, say, the very wide difference between the inside temperature of 104° and the outside temperature of 32° and the consequent density of the latter induce a very rapid change of air which dries the eggs, too rapidly in the latter case and too little in the former case.

"In hot-air machines the fresh air goes in at the top at one uniform high temperature regardless of the outer temperature; the cooler this is the more heat is absorbed in the heater to raise the ingoing air to the required temperature. The heated air gradually descends to the lower and also unvarying temperature about the eggs, below which it diffuses outwards at a rate, like the case of the tank machine, in proportion to the difference in temperature (and density), the area of outlet remaining the same, between the inner and outer air, the colder and denser the latter the more rapid the diffusion. But in these machines the area of outlet can be increased by removing the bottom felt or felts, or opening the incubator bottom, thus making up by increasing the diffusive outlet *area* what is lost by the reduced *speed* of diffusion as the outer and inner air get nearer the same density. With the fixed outlet ventilating holes above the eggs in tank incubators the outlet cannot be increased for hot weather. The number of holes should, therefore, be sufficient for warm weather and some of them corked up for cold weather. This could be effected by having slides working on the 'hit and miss' principle to control the holes or area of outlets, which, in this case, could be much larger to provide for warm weather. There is little, if any, difference between the two types as regards even distribution of heat. The mobility of the volume of cooling air, gradually descending, is such as to render the temperature uniform at any given level. The water in a tank-machine has an even temperature at the bottom of the tank, unless this evenness has been interfered with by deposits of sediment, but in the imparting of this heat by radiation through the intervening two to four inches down to the eggs there is as great a likelihood of inequalities arising, especially as the ventilation is from below, as with descending air.

"Air heats and cools much more quickly than water, therefore should the supply of artificial heat fail, either wholly or partially, a hot-air incubator would much sooner fall to the temperature of the outside atmosphere than would a tank-machine, as the latent heat in the water would keep the temperature in the egg-chamber from falling injuriously for many hours. For the same reason heating by hot water tends to prevent fluctuations and to check sudden accidental rises of temperature.

"In the tank incubators the moisture is in the bottom. The ingoing air becomes partially charged at a low temperature, but as it rises and becomes hotter its capacity for absorption of moisture increases, and thus there may still be a tendency to dry the eggs too much, especially if coupled with a rapid passage of air, as in cold weather. In hot-air incubators the heated air goes in at the top at an unvarying high temperature. As it descends and cools its capacity for absorption is reduced (which is one of the reasons why no applied moisture is necessary) and therefore passes the eggs with less danger of drying them.

"Carbon dioxide and other gases exhaled from the eggs during incubation are heavier than pure air and more readily fall with descending ventilation than rise with the ascending air in tank machines.

"Hot-water tanks are liable to give trouble from leaking after being in use for a time, and when that happens they are troublesome to repair. There are also more interval flues in a tank machine, which increases the risk of trouble from getting choked up with soot, which is often a cause of failure to get the heat up sufficiently quickly."

Mr. Sutcliffe's comparison just quoted explains the matter very clearly, and we may here remark that in America the hot-air system is far the most in use. One reason for American preference of the hot-air type appears to be greater economy of oil, which on a large scale becomes of importance. The latest and best makes of these machines are able entirely to *dispense with moisture*, and thus register real advance. Almost universally they employ efficient metallic thermostats, which do not vary with the barometric pressure, as do those which, depending on vaporisation, are liable to several degrees of fluctuation independent of outside temperature.

From the British Isles we have so far received the best averages of reports from tank machines, whose popularity we have seen to be connected with the simplicity and uniform action (within certain limits) of Hearson's capsule regulator. It has been shown how a tank of water *steadies* the temperature, acting as a fly-wheel; so much so that even if a lamp should go out, the heat might probably remain sufficient for hours to prevent fatal results. These machines thus possess more immunity from catastrophes caused by accidents. On the other hand, they respond much less quickly to sudden changes of temperature, while specially sensitive to changes in the barometer, and are thus more liable to failure from weather conditions. If it be remembered that at the best there must be some variation in temperature at different parts of an egg-chamber, a possible variation of 3° or 4°* from barometrical changes alone may become a very serious thing, especially in the early stages of hatching. Many such variations which occur are never suspected. We have in our own early experiments often supposed that the heat in the comparatively rude apparatus we were then using was within 2° of variation, because we found it so at periodical morning and evening inspections; but when we put in a certified *registering* thermometer, we found that the variation under the same arrangements had really amounted to as much as 6°. Now sometimes this effect of the barometer upon the capsule may be actually beneficial. Suppose pleasant cool weather with a high barometer, to be followed by a rapid fall, with sultry heat and a storm. Then the lower vaporising temperature will the more easily and rapidly adjust matters in the egg-drawer. But imagine cold and raw but rainy weather, with a low barometer, in spring, to be followed by bright, hot weather. As a result, the heat would run dangerously high, and the chicks, if at an early stage, be probably killed. Thus it will appear that a capsule thermostat must not be left to work unchecked, but that a barometer or aneroid, and a thermometer for the room itself, should always be used with a machine of this class. The matter is of the more importance, as it will be seen in Chapter VIII. that variation in temperature is directly connected with incomplete absorption of the yolk by the hatching chicken.

The hot-air machine responds much more quickly and sensitively to changes of temperature, and with good thermostatic regulators is independent of the barometer, and really automatic in action; with, however, the proviso that in cool-bottom machines there be a double-acting regulator, as explained above. On the other hand, in the case of hot-air machines a neglected lamp or flue must spell disaster, and it obviously requires a more accurate and sensitive thermostat or constant attention. Neglected lamps are not to be dreaded in large systematic establishments: the smaller breeder must judge for himself whether he can trust his own carefulness, or whether he prefers the safety-valve (in this respect) of a tank machine.

Management of an Incubator.

Coming now to the practical working of an incubator, any reader of intelligence will have already gathered that in different machines details of management may differ considerably, according to the construction, even in really important points. No better advice can therefore be given than that, before starting, the instructions sent with the particular incubator in use should be carefully studied and followed. The manufacturer is supposed to understand the proper conditions for working his own machine; and though we regret to say that in the case of some productions this is not the case, as regards those which have held a market it generally is so. In regard to choosing, it will be well to confine the choice to some make which has *held its position for three years.* We may say that so far, of every English machine that fulfils this condition, we have had ample evidence of good results when carefully managed. In America such a rule would be too stringent, excluding, perhaps, some good machines; but there the immense scale of operations, carried on by men whose names are household words, gives an amount of testing in a short time which is equally effective. It is simply the amount of experimental proof, in either case, which the purchaser has to consider.

Where the incubator or incubators are to be placed should receive consideration. Constant noise may cause no injury; but sudden occasional loud noises, or concussions, are known to cause deaths and deformities. Even a hen instinctively chooses a quiet and retired place. It also helps to have as uniform a temperature as possible, especially if the regulator is not of the very best. Airy, dry cellars answer exceedingly well, and in America some of the large poultry-farmers find it pays, by increased production, to build their special incubator-rooms as half cellar or basement and half above ground, or to bank up soil round the greater part of the walls. Recent improvements in thermostats remove a great deal of the necessity for this; still, extremes of temperature are better avoided as far as possible. Another point of some importance is that the incubator should not be in a direct draught, else the eggs may be dangerously chilled when withdrawn for turning or airing.

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* Mr. Willan's register for thirty-two days, published in Messrs. Hearson's pamphlet, shows a variation from 102° to 106½°, or 4½°.

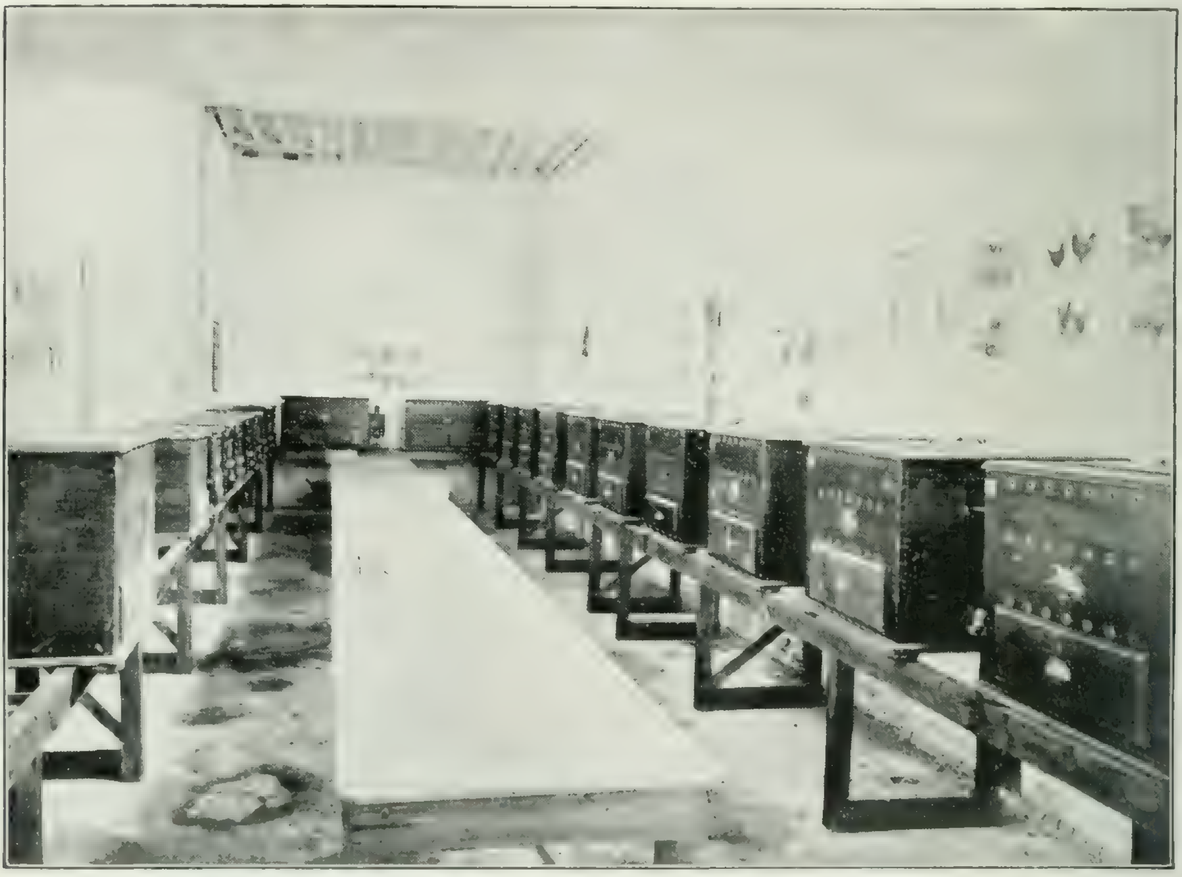

Fig. 46.—Miss Edwards's Incubator Room at Coaley, Gloucestershire.

In Figs. 46 and 47 are illustrated two good examples of incubator rooms. That of Mr. Karstendiek, of New Orleans, containing as it did when photographed fifty-five 300-egg incubators, shows on what a scale incubation is conducted in the States, and we have had notes of even larger installations. Fig. 46, illustrating as it does part of the establishment of a well-known British lady poultry-farmer, is not less interesting, for it shows a clever adaptation of existing farm buildings. It is a room 43 feet long by 12 feet wide, and about 16 feet in height, and was the cider cellar of the old farmhouse, which, by removing the flooring of the room above it, has been converted into a fine lofty chamber, with plenty of light and air. Built with thick stone walls, and the floor sunk some 2 feet below the ground, with windows high up near the ceiling, this cellar makes a splendid incubator room. Fresh air is admitted by well inlets low down in the wall at intervals beneath the incubators, and the vitiated atmosphere rises and passes out by the windows some 12 feet up near the ceiling. The room faces south, but is protected from too much sun by a sheltering yew tree, and against the north side are stables and out-buildings.

The incubator should be carefully levelled. This is essential to the lamp-flues working properly, whether through a tank or a hot-air chamber; and a difference of level will in many machines make one corner of a drawer hotter or cooler than the others. Where it can be done, it is worth while to equalise the temperature by placing a test-thermometer in each of the four corners of a drawer. Prospectuses may state that the heat in their machines is so "uniform" that the eggs do not need any change of position. We have not found it so. Far more usually the back corner next the lamp is hottest, next the other back corner, then the front corners in same order. Each machine seems to have its own peculiarities, and by propping up one corner or end a little, where the construction admits of this, a drawer may often be more nearly equalised, though no machine has ever yet been made in which the heat is uniform all over the drawer. It is unfortunate that all incubators are not made with glass doors, or even separate doors to be closed when the egg-trays are withdrawn for cooling. In America nearly all of repute are thus furnished, and this detail not only facilitates the adjustment here described and examination of thermometers, but saves much loss of heat at the periods when the eggs are attended to. We should, in fact, advise that any incubator not already furnished with a separate outside door, to be closed when the drawer is taken out, should have a caulking shield or lid provided to fit into and stop up the opening, and so confine the heat.

Temperature.

In regard to temperature, it will follow from what has been said, that no positive figure can be given, even for one kind of eggs—we here suppose hen's eggs. Both the figure, and the best place to put the thermometer, will differ with the machine; and the place of the thermometer will affect the figure. In some top-heat machines which are freely cool at the bottom, a quarter of an inch lower for the thermometer bulb will make it read one degree lower for the same heat of the drawer. Thus it is that Mr. Hearson, with his thermometer higher than the top of the eggs, gives as the proper heat 104° for an outside temperature of 60°, while 1° has to be allowed for about 10° outside temperature in order to keep the bulk of the *egg itself* at the same heat, according to the warmer or cooler bottom. It must never be forgotten in machines of this class *not to leave all to the regulator*, but to adjust the latter according to outer conditions; and this is a very good instance of the need for following special directions, which may not apply at all to some other machine.

A usual practice is to lay a thermometer *on* the eggs, taking care after the tenth day or so that it lies upon *live* eggs. In this case 102° will be about the right heat for the first week or so, corresponding in average machines to about 99° at bottom of the tray. But where this system is followed, it is most important to bear in mind that about the ninth day the life of the chick begins to quicken, and after the eleventh day to add a great deal of its own animal heat to what is supplied. Hence, after the tenth or eleventh day a thermometer upon a live egg may run up to 105°, without the heat in the drawer being really more than about 103°, whereas if 105° were shown upon a dead egg, the heat would be too great. For this reason the more recent and better practice is for the thermometer not to rest on eggs at all, but to be in one fixed place, with the centre of the bulb level with the top of the eggs. The temperature for hen-eggs will then be about 103° for machines with decidedly cool bottom, or 102° for machines where the heat is more evenly diffused in the egg-chamber. In either case the thermometer may probably register about one degree higher after ten or eleven days, owing to the greater heat and proximity of the quickening eggs; but this is about as it should be in hatching, and is no fault of the regulator. As it has been well expressed, while for the first ten days the temperature of the egg-chamber controls that of the eggs, after that, to some extent, the temperature of the eggs controls that of the chamber.

Thermometers.

The differences in temperature given by various operators will now be understood, as depending upon differences of level or in machines. Statements that only machines with "top heat" will hatch successfully are mis-statements. The egg-ovens of Egypt, as well as certain incubator experiments, show their absurdity. Top heat, or all-round heat, or bottom heat will all hatch, if the heat be right. But the very best thermometers commercially obtainable also differ somewhat. In the early days we noted many which differed four degrees, to which alone many disasters were due. Even now many differ half a degree or one degree, and this should be allowed for as verified by comparison with one tested and *old* thermometer kept for a permanent standard; for it does not seem generally known that even a well-made thermometer, accurate when new, will often show a *rise* of from half a degree to a whole degree, or even more, when it has been in use twelve months, the first six months being most apt to show such changes. For this reason, in America it is now customary to keep the best thermometers for six months in a heated chamber before supplying to the incubator manufacturers, and it is desirable that this system should be followed. Any thermometer can be easily used, by ascertaining its "correction" from the standard one, which is best done by immersing both in a pail of water heated to about 105°, and kept stirred: without stirring, the water may heat the two quite differently. The test described by some of putting the thermometer into the mouth is not to be depended upon within two degrees.

For these thermometric reasons, first adjustments of temperature may fail in practice; but there is a simple common-sense rule by which in that case the error may be corrected. If fresh hen's eggs which hatch pip between the evenings of the twentieth and twenty-first days the heat has been about right; at all events the average heat, apart from faults in regulation.* If the eggs pip a day earlier the heat has been too great, and a shade lower had better be tried. If on the contrary *fresh* eggs are decidedly late, then the regulator should be set a little higher, whatever the thermometer may appear to read. It is especially to be remembered, that *too high a temperature is particularly fatal during the first ten days.* During that period a few hours of 106° would either kill chicks outright, or so weaken them that they would probably die in the shell; whereas later on an accidental baking will, if in a dry chamber, often be borne with impunity—even 112° for four hours has then been recorded, with still a fair hatch. It has been found that if such a state of affairs occurs, the best procedure is quickly to damp a towel with warm water and spread it on the eggs, replacing the tray, but *leaving the door open* for a while. This cannot be done unless there is a door independent of the drawer or tray; otherwise, leave the drawer partially open for a while. Such a door, including a *glass* door, is very desirable for all sorts of reasons, and especially for reading the thermometer. Where there is none, the stem must either be pulled out or the drawer opened. In the latter case the reading must be taken instantly, as there will be a rapid fall. In some of the large establishments of America a small electric light is fitted up close to each thermometer, which is switched on and the reading taken as the attendant passes each machine in turn.

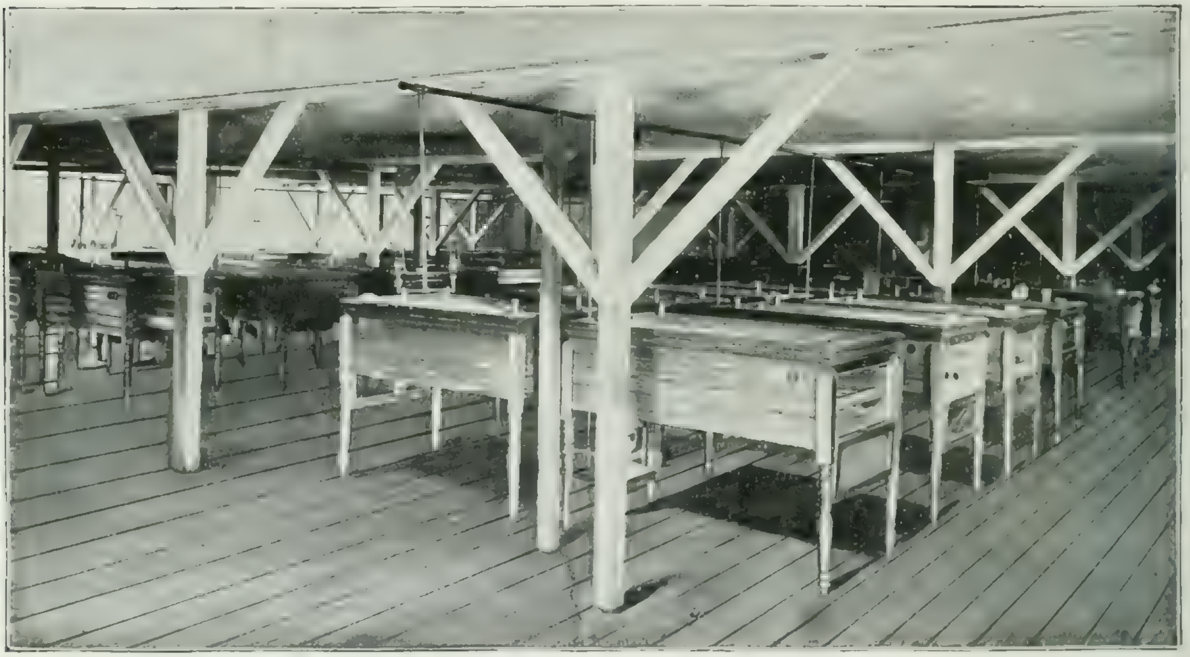

Fig. 47.—Incubator Room of Mr. H. S. Karstendiek, New Orleans.

Choice of Eggs.

The temperature should have been held steady for at least a day before any eggs are introduced. Of course, it is foolish to risk valuable eggs in a first essay; fresh and strongly fertile common eggs should comprise the first attempt by inexperienced hands. Some care should always be exercised in selecting eggs for an incubator. A few years ago they commonly died if set when more than three or four days old, showing that vitality must in some degree fall off; and most makers' prospectuses still state that eggs over a week old are of little use. Nevertheless, with improvements in machines, eggs a fortnight and even three weeks old are now often used, with results equal to those obtained by the natural method in similar circumstances. No one questions, however, that the freshest eggs are the best, though up to a fortnight the chief difference is found to be in somewhat later hatching. It is of more importance to reject small or large eggs, and especially those with rough or porous shells, or any obvious fault at all in soundness of shell. Some such eggs which might hatch under a hen fail in an incubator, because of too rapid evaporation.

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* Bantams' eggs, and other small ones, average a day or more earlier, and should reckon accordingly.

Proceeding from these fundamental details of artificial hatching to the daily routine, it may be well to explain that good results have been hindered by several fashions or ideas, which in succession have dominated those working in this field, and which all of us more or less shared in our time, the fact being that no one then knew any better. Some of them are still believed in by many, and several points in management, if adopted, involve others. There has been a cooling or "airing" era; then a "carbonic-acid" theory and consequent "ventilation" era; and (consequent really upon this last) finally came a "moisture" era. It is curious now to reflect, that all these might have been checked and moderated, merely by adequate consideration of the egg-ovens of Egypt. Let us proceed, however, to consider practically the routine in detail.

Unfailing regularity in trimming and filling the lamp need hardly be insisted upon; merely the use of an oil inferior to that for which any lamp is constructed, may give much trouble, even if it does not cause failure, by creating smoke and choking the flues. Flues and chimneys should always be looked after at proper intervals. A flat wick is best trimmed very slightly convex on the top, or with the corners very slightly taken off, when a rather tapered flame much less liable to smoke is obtained. When the flame is not too high, smoke usually occurs from a high corner of the wick. Wicks chemically prepared so as to need little trimming during the whole of a hatch are now largely used and supplied by the best incubator manufacturers, and have greatly lessened one of the most troublesome and tiresome portions of incubator work.

Turning and Moving the Eggs.

The first thing to see to in regard to the eggs, is to turn them over regularly twice a day, except at the very beginning and again at the end. At the beginning, it is better to leave them undisturbed, to heat up, for the twenty-four hours. A mark should be made on the middle of the side of each egg, that it may be seen how much the egg is turned over. Some lay stress upon turning the egg exactly *half* over each time; but as that brings the germ exactly to the same spot in the shell every twenty-four hours, and to the same portion of slightly evaporated albumen, it cannot be beneficial. Most egg-trays are lower in the centre; the best way then is to take out an egg from the lowest part, and let the row above it roll very gently down the hill, the whole row turning as it goes, placing the egg taken out in the vacancy at the top. The eggs will probably roll over rather more than a third, but no exact aliquot part. The same plan can be followed even in flat trays, and it also saves time. But its greatest advantage is that the eggs also change places, an egg being taken from probably the hottest part of the tray to the outside, and the others moved as well as turned. It has been fully demonstrated by systematic experiments that this is of great importance. As already stated, no incubator yet made is the same heat all over the tray, and those which claim to be so are not even the best in this respect. Changing places "evens" these differences, and, as already mentioned, is regularly carried out in the egg-ovens of Egypt, and is even done by the hen herself. We have marked many a hen-hatch to ascertain this, but quote the following from an old correspondent: "At 10.30 a.m. marked four eggs in the centre of the nest. At 1.30 p.m. three marked eggs were at the outside, one still at centre. Marked three more in the middle. At 2.45 p.m. the three last marked were moved to the outside, and four marked first were also at the outside; marked four more left in the middle. At 4 p.m. the four marked last were at the outside, and some of those marked first were back in the middle of the nest." Thus does even the hen move her eggs from centre to outside of her nest, and the average difference, as the result of American experiments, is estimated at 5 to 6 per cent. in favour of those so treated.

Airing or Cooling.

This is one objection to the system of "automatic" turning introduced in some incubators; another being the tendency to return to identical position, already alluded to. But further, the short cooling during the removal of the tray to the outer air for this purpose, is actually beneficial to the eggs. This also has been experimentally proved, if only in a percentage, although very good hatches have been obtained without any such withdrawal. The turning should be done deliberately and gently; and when so done, the eggs of a large machine are generally best returned at once. But they may be left outside for ten minutes or more in warm weather, or five minutes even in winter, unless the room be nearly freezing. Many have advocated, and still advocate, leaving them much longer; but it is now known that such "airing" has been much overdone, and that where it has appeared beneficial, this was because it remedied in some degree the effects of too much heat, or too much moisture. It is manifest that in large hatching-chambers or ovens the eggs get no cooling at all. Exception may be made in hot weather, when "quickened" chickens may add so much heat to the chamber, that any valve may hardly be able to keep the temperature down. We have known the thermometer at 92° in the room, even in England; it will easily be understood that in such a room, and with lively "quickened" eggs, the smallest flame possible may run the egg-chamber up too high, and long, even repeated airings will often at such times help the hatch. Mr. J. L. Campbell records one extraordinary experience during a "heat-wave" in America, when for five days and nights he had to take out his egg-trays and keep them on a table, and the eggs never got below 105°. But these are exceptions. The chamber should generally be closed while the eggs are withdrawn, in order that they may go back into nearly the proper temperature.

Testing for Fertility.

Not later than the sixth or seventh day the eggs should be tested for fertility, and sterile ones taken out. This is more important than in natural hatching, owing to the difference already mentioned between the heat of a live and of a dead egg. This difference, when a large number are collected, as in an incubator, becomes much exaggerated. If the chamber is, upon the whole, at the right temperature for live eggs, any live eggs surrounded by dead ones will be insufficiently heated. Moreover, a thermometer laid upon eggs may appear to play all sorts of pranks. For small occasional hatches, nothing need be added concerning "testing" to what was said in the preceding chapter; but the large or systematic operator will find it worth while to use more powerful appliances, and will very soon become more expert, so as to be able to detect sterile eggs on the third or fourth day. Brown-shelled eggs are less transparent, and duck eggs more so than white hen eggs, so that many of the duck-raisers can tell if an egg is fertile after about thirty-six hours. In the first edition of this work we figured an egg-tester with a concave reflector behind the flame of a lamp, and a lens in front, to condense the light upon the egg; but at a later period, being asked by a friend for optical advice * as to the most powerful instrument that could be devised, we designed one as in Fig. 48, whose effect in bringing out the early stages is very marked; but whose efficiency depends upon the details being optically correct. Here L is an oil-lamp with an inch-wide wick, and R is a silvered reflector, whose curve should be struck from the centre of the lamp-flame. In front is a lens C of 3½ inches diameter and short focus, such as is used in a magic-lantern condenser, arranged at a little more than its focal distance from the flame, so that it transmits the rays in a slightly convergent beam, thus concentrating them upon the egg E. Beyond the lens is a flat mirror M, placed at an angle of 45 degrees, so as to reflect the rays perpendicularly upward upon the egg E, laid upon a proper orifice in a horizontal screen. The efficacy of the instrument depends partly upon all the rays taken up by a rather large lens and reflector, being concentrated into a space the size of an egg, and partly upon the egg being laid horizontally to receive those rays, so that the germ, lying close to the top side of the egg, shall be more clearly seen. The egg is also removed to a more comfortable distance from the flame. Such an instrument would be put together to order by any respectable optician. In using it, care should be taken to lay the egg down in the same position in which it was taken from the tray, in order that the germ may be steady near the top side, nearest the eye.

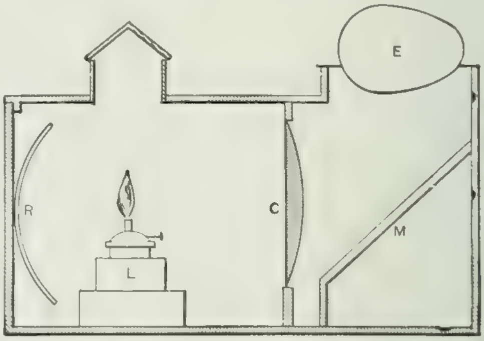

Fig. 48.—Egg-Tester.

When thus powerfully illuminated by a good tester, the fertile germ is much more characteristic, a small opaque spot being surrounded by small red blood-vessels, clearly seen, branching from it. With practice these latter will be seen earlier and earlier, even before any very dark spot appears. Sterile eggs remain perfectly clear. Fertile germs which have died, or addled eggs, present all sorts of appearances, which need not be described, constant practice being the best teacher; but, generally speaking, a red circle without branching veins, or a red line near the side of the egg, denotes a dead germ or broken yolk, and, later on, a sort of floating dark mass surrounded by transparency, spells "addled" to the tester. Let the learner, however, mark all doubtful eggs, and then observe how they turn out; and in a short time he will be surprised at the certainty with which his tester will reveal to him the state of affairs. It should be remarked, that whereas really sterile eggs do no particular harm beyond perhaps robbing live ones of heat which they require, dead germs, being on the road to putrefaction, are poison in the egg-drawer. Eggs with discoloured shells, or with exudation appearing, or which smell offensively, should be removed instantly, and it will be found that every one will have been marked as at least doubtful, beforehand, after a very little experience. The eggs should be tested again about the fourteenth day.

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* The author of this work will be known to some readers as also the author of several upon "Light," and various branches of practical and experimental optics.

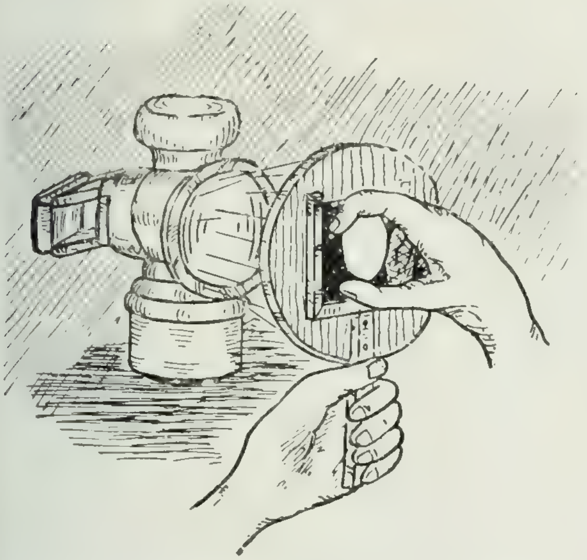

Fig. 49.—A Home-Made Egg-Tester.

Easily made with a bicycle lamp and sheet of zinc, or cardboard, painted black, and an aperture cut to size of egg.

It does not answer well to fill up vacancies, made by testing, with fresh eggs. It can be done, and if these are warmed up first, cooling of the chamber by them can be avoided. But as hatching proceeds, rather different conditions of temperature and moisture prevail, and are according to Nature's plan; hence such mixtures always impair the result. The eggs remaining in a chamber should be either collected or spread out equally; else those close together will be hotter than detached ones in another part of the tray.

Ventilation and Moisture.

Ventilation and moisture are essentially connected together, and there is now no doubt that both have been to a very large extent overdone, each of them owing to that connection. Early incubators were made with close chambers, and practically no ventilation at all; naturally the want of fresh air caused failure, and great improvement immediately followed the introduction of free openings for exit, and inlets for the air, the latter being usually at the bottom of the machine. This arrangement causes the most rapid circulation of all; and as evaporation is in direct proportion to the *movement* of drier air over the evaporating surfaces, the eggs were rapidly dried up, and many chicks glued to the shells. For this the remedy was "moisture," which was given freely in various ways: by cold tanks at the bottom, damping earth or sand in a tray under the eggs, or water-trays at the top of the chamber. Great success was now very often attained, and it was natural for it to be thought that free ventilation and moisture "was the great secret" of successful hatching. To such an extent was this belief at the time held that some incubator users considered that if the moisture in the egg-drawer were increased, the greater would be the number of eggs hatched. On the direct contrary, from queries and dead eggs which have been sent to us during many years, there can be little doubt that more dead chicks have resulted from too much moisture than from any other cause, and incubator users will do well to note this.

The *due proportion* between ventilation and moisture is no doubt, next to proper heat, the cardinal point; but the whole matter has had to be cleared up by fresh investigation, and has now been completely elucidated by the far larger experience of operators and manufacturers in the United States. While temperature remained variable to the extent of several degrees from atmospheric conditions, occasional (and often unknown) overheating was again and again in a measure rectified by cooling and airing; but this is now better guarded against either by better thermostats, or by adjusting these according to the outside barometer and thermometer. So also, ventilation through free apertures generally so dried up the eggs that ample moisture was necessary; and the cold bottom supply in so many tank machines very generally strikes a rough balance, and gives success. But there are also many failures; for no such plan gives the same moisture always, and it is not correct to state, as in a treatise before us, that Dalton's tables of water-vapour tension imply any such consequence as that the moisture of a chamber over cold water will always be the same. The temperature is not always the same over the water-trays in the machine described; and the rate of movement (and consequent *time* allowed any given portion of air to take up vapour) is all-important, and differs immensely in various states of the atmosphere. When the men who ran fifty large incubators at a time, and the experts who manufactured machines for them, began to study the question systematically, they soon remembered that there was no draught and no moisture at all in the old egg-ovens; and that the plumage of the hen, over the concavity of her nest, prevented any but very slow interchange of air there, while she also was able to hatch eggs upon a dry shelf, as well as upon damp ground. They concluded that Nature had supplied enough moisture within the egg itself to hatch it successfully; and they were right in the main, though some of them have perhaps carried that principle a little to excess. They therefore began to *slow the ventilation*; not to stop it, but to check actual current of air as much as possible, remembering also that twice a day the drawers would be opened, and the air renewed that way. Ventilation from top to bottom, which is slower in movement than from bottom to top, became the rule; and that was further hindered in actual flow by circuitous flues, or perforated or porous distributors, till the climax was perhaps reached in porous walls forming the sole medium for exchange. At once moisture became unnecessary, and many incubator users rushed to the conclusion that none was *ever* needed, even in well-known machines of a somewhat older school. Frequently that, too, proved to be the case, and many people began to get better hatches by quite abandoning moisture, even with hot-air machines, often stated in England to require "more moisture" than the tank machines. And when that was not quite the case, results were obtained which were in some cases startling. Nevertheless, many people would no doubt do much towards more successful hatches by filling the apertures for ventilation with *loose* cotton wool, so as to allow interchange of air while stopping current, both at top and bottom of machine; and then using no moisture for sixteen or seventeen days, and only a little at the close, using more in dry weather.

The Air-cell as a Test.

Such, however, is rather a blind guess; and in the United States they have now reduced the whole matter to a science. It is all determined by the *size of the air-cell* in the developing egg. This was first ascertained with hen-hatched eggs, and diligently compared with incubator eggs more or less successful; with the result that while different eggs would vary a little in the same hatch, on an average the air-cell should show enlargement at the fifth, tenth, fifteenth, and eighteenth days, about as in the diagram, Fig. 50. After the nineteenth day, the beak of the chicken may at any time pierce the membrane, and the head burst into the cavity, when comparison is impossible.

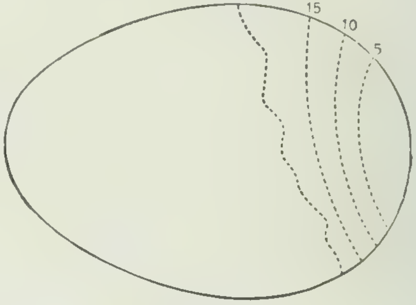

Fig. 50.—Air-cell.

It should be clearly understood that sufficient evaporation to thus enlarge the air-cell is *necessary* to successful hatching, and that too much moisture acts by preventing this. The tissues of the chick are then too soft and moist, and the egg is packed too full at the last for the chick to turn round and break its shell. On the other hand, too large a cell means too small a chick, and too tough and leathery a membrane, and perhaps actual glueing of the chick to the shell. If the air-cell is allowed to dry out too much, the chick can be swelled afterwards by giving more moisture; but this does not really repair the mischief; it will never be so strong a chick as if all had gone right. In the majority of American incubators, best average results are said to be obtained by giving no moisture for about seventeen days; then a little or not, according to the size of the air-cell. In our moister climate the same might hold even with more ventilation, but for the strong up-draught of many machines. The breeder who examines the air-cells by his tester, however, and notes the results and state of the cell in different kinds of weather, will be armed at all points. In America, at all events, with the slow ventilation there usual, it is found that the greater proportion of failures occur from insufficient drying-out of the air-cell. There is another important point in favour of slow ventilation (which must nevertheless be sufficiently *free* ventilation—a quite different thing) and a dry egg-chamber. It has been proved conclusively that over-heating, should it occur, is four or five times as fatal when the air is charged with vapour.

On the whole, it has become the general practice amongst American hatchers who will not "fuss" about the size of air-cell, to give no moisture for about seventeen days, as above, and then supply a little during the last two or three days of hatching. This would hardly be safe without the air-cell test, with the different types of machine used in England. We believe that even in America, to use no moisture at all, under *all* circumstances, is a practical mistake. Such hatches are not quite all successes; and though we have already indicated the former general mistake of overdoing moisture with the old sitting-hen, the fact remains that there are cases in which, even with hens, some vapour does greatly help a hatch. It must be the same with an incubator; though we believe that with many American machines all that is necessary would be best done by placing, in brisk, dry weather, large shallow pans of water about in the incubator room, or to water the floor of the room, so as to moisten the air outside rather than inside the machine.

It is found that eggs themselves may differ greatly in behaviour, and this is no doubt one reason why selection is so important for incubator hatching. Mr. Rankin ascertained by repeated experiment, that when hatching without moisture in his "Monarch" incubator, the sound good shells hatched all right, but that some eggs dried up too much. These were found on examination to have porous places in the shell, and to have dried up much more than the others. He made the remarkable experiment of coating two-thirds of an egg, from the small end, with shellac, and hatching without moisture. They hatched well several times, but when he much reduced the clean space at the large end, they failed. Here the hen has an advantage, in slightly greasing her eggs by contact with the skin; and we have often thought that turning the eggs with very slightly greasy gloves might have good results. The air-cell may not be too much dried out, and yet the membranes may be rather too tough and leathery at the last for easy hatching; hence the American practice, above alluded to, of giving some moisture the last three days, which is tantamount to the hot-water final soaking-test described when dealing with hatching under hens.

Hatching-out.

With a view to the final hatch-out, if the tray admits of it, the eggs should always be kept with the large end slightly higher than the other. This tends to prevent the chick's head being at the small end. The eggs should not be turned during the last three days, in order that the chick may have a better chance to "get its head up." When eggs are pipped, the fracture should be turned upwards, if not already so, which will probably be the case when turning has been discontinued; and it is better to move such eggs near the door, where they can be seen—another reason for glass doors. They should not be meddled with oftener than about every six hours; but a lot of damp struggling chicks, breathing freely, do not help the others, and the egg-chamber is, moreover, too hot for them. Every six hours or so, therefore, they should be removed to the drying-box (which is usually in England on the top of the machine, or else supplied as a separate apparatus), although in some the admirable American method is adopted of automatic delivery of the chicks to a nursery below the egg-trays. They should be entirely out of the shell in from eight to eighteen hours after pipping; after the longer period it is pretty plain that they need assistance. If only the shell is broken, break the membrane through also to give air, and if it appears too leathery, a little warm water may be introduced, avoiding the beak and nostrils. This may be sufficient. If still no progress, the shell may be gently cracked round, when a fairly strong chick will generally be able to burst it asunder, especially if moistened with a camel-hair pencil round the crack. Sometimes, by immersing in warm water, a tough membrane may be gently peeled off, but so far as our experiments went, more than the above rarely proved worth while.

Chickens Dead in Shell.

It will be seen, that when we are asked "why chickens are found dead in the shell," or addled at an earlier stage, there may be many replies. The eggs themselves may have been too weakly, from the parents being too old, or too young, or too fat, or too in-bred, or the male being over or under-mated, or the stock being badly fed. The eggs may have been chilled, or may have been over-heated. They may have had too much moisture, or they may have had too little for the ventilation. The air may have been too damp to dry out the air-cell sufficiently, or so very brisk and dry as to toughen the membrane, even though things were right in the main. Many of these things often happen in a nest of eggs under a hen, and are simply brought into higher relief with an incubator, owing to the number involved, and the fact that they are then always supposed to be the fault of the machine or of the management, which is, however, by no means always the case. Some of the causes are only partially within human control in a practical sense.

Hatching Duck Eggs.

Duck eggs require a little different treatment to get the best results; they can be hatched with others, but the average is not so good as when separate. It is generally agreed that a little lower temperature is better; but the difference depends upon the machine. Mr. Hearson advises two degrees less, and somewhat the same may be necessary whenever the capsule is higher than the eggs, and there is a cold moist bottom temperature. With American hot-air machines, half a degree to one degree less is more usual. Where free ventilation and free moisture are used, a little more moisture during the last few days, not before, is also generally better for duck eggs; but the size of the air-cell, as already described, must be studied in reference to this. Many large operators also think more airing or cooling advisable, but taking care to close the drawers whilst the trays are out, in order that they may heat up again as quickly as possible. The following remarks on incubating duck eggs have been furnished us for publication by Mr. Henry E. Moss, at one time manager of Mr. Morgan's great duck ranch, which was situated at Riverton, Virginia. We had observed from our study of American poultry papers, that while 50 per cent. of live ducklings to eggs seemed about the general American average,[*] Mr. Moss's were considerably higher, and by common notoriety were above those obtained by other raisers of ducklings on the large scale practised in the States. His incubators were all on the hot-air principle, and it will be seen that he writes rather differently from other breeders concerning both moisture and cooling.

"The artificial incubation of duck eggs differs very materially from that of the eggs of other fowl. It does not follow that eggs from whatever source will respond to the same treatment, and yet many large duck farmers in this country have for years persisted in doing this very thing. The writer has for some years been making a practical and thorough study of this question. Operating from thirty to forty incubators each season on duck eggs, studying cause and effect, and reasoning deductively rather than inductively, he has achieved a greater measure of success than has previously been recorded, and while not fully prepared yet to describe every detail, will briefly make clear some of the important points.

"The first and most important requirement is proper heat. It is necessary in order to obtain the best results to maintain a uniform and unvarying degree of heat at the upper surface of the egg. This uniform degree of heat should rest on every egg alike. This is a condition which never has and perhaps never will be found perfectly attained, in any commercial incubator. Incubators do their best work when run in an underground room, or cellar, or cave, where a uniform temperature of about 65° can be maintained; otherwise, uniformity will depend upon the efficiency of the thermostat. After the machine has been slowly and thoroughly heated, and then held steady for twenty-four hours at 100° with the thermometer lying on the tray, the bulb free, you are ready for the eggs. During the first forty-eight hours do not disturb them, but as soon as they are in the machine turn on rather more flame, and get the heat up quickly to the proper degree, which is 102°, the thermometer resting upon the eggs, the top of the bulb on a level with the top of the eggs. As soon as the heat is up to 102°, see that the damper-valve is slightly raised, and then turn down the flame low enough to just hold the damper up a trifle. If the room is subject to a sudden fall in temperature, however, adjust the flame a little higher than ordinary, so as to be prepared for the emergency, and trust to the heat-regulator.

"During the first few days, and before the animal heat develops in the egg, adjust the trays by raising or lowering, if necessary, so as to secure the same reading on all the thermometers. When this is done do not change their elevation again, no matter what difference may seem to exist, but change position of the trays daily, in order to average variations in temperature.

"The first test can be made about the sixth day, the second on the sixteenth, when if the development has advanced as it should, the allantois will have nearly or quite encircled the embryo, rendering the egg nearly opaque. After forty-eight hours begin the regular turning twice a day. Do not jar the eggs, but handle very carefully. After testing replace the trays so as to keep the *vacant rows in front*, in which place the thermometers, which hold at 99°. After the twelfth day you will notice the temperature rising, with the adjustment as you have held it: it will now require less flame, and the adjustment of the damper-valve will need to be altered a little. The fact is the animal heat is now rising, and if the machine is full of live germs it will need close watching. Examine it the last thing at night, or you may find the heat up to 105° or more on the eggs in the morning, especially the third week; and if this occurs many will suffer or die in consequence, not immediately, but lingering along until almost the end of the hatch, when they finally expire. After the third week this danger is not so great, as the animal heat remains about stationary, or declines a little until exclusion begins, when it increases. A temperature of 105° or 106° is desirable at this time, and do not let it fall below 103° until all are excluded. When the last one is dry, open one of the doors about two inches and securely fix it in this position, and let it remain for twenty-four hours, so as to accustom them to a slightly lower temperature before removing them to the brooder.

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[*] This average may seem low; but it is to be remembered that a large quantity of the eggs are winter-laid, and most of them from ducks kept in large families, some in large flocks, for economy in management. Under these circumstances the fertility of the eggs themselves is heavily discounted. Our own "early breeders" know best how much such an average, on *thousands hatched*, really means.

"The only cooling of the eggs that should be done besides what they get during the daily turnings, is during the third week, when they should be cooled down daily till a thermometer on the eggs in the drawer stands at about 90°. Under no circumstances cool any during the last week. It may be argued that cooling from the start is the natural process, which I admit; but we must refrain from practising it at any other time than specified, because we cannot as quickly restore the incubating temperature as the parent bird. It often takes us several hours to accomplish what she succeeds in doing in fifteen minutes after resuming her nest.

"Ventilation is the next important question. The most common and usual practice is to ventilate to excess for chicken eggs, and add still more to the duck egg, because it is larger. This is a serious mistake. In either case there should be only sufficient ventilation to keep the air in the egg-chamber respirably pure, and this must be admitted in such a manner as to produce no perceptible currents. A moving body of air will absorb and carry away all the available moisture it can gather, and its capacity for moisture is increased in proportion to its rise in temperature, and its *velocity;* hence fresh air taken into the ventilating flues at a temperature of 65°, even if laden to a high degree with moisture, will on being heated to 103° have a capacity for more, and will abstract it from its surroundings until the tension is equalised. In this way the egg may be robbed of its moisture, and the embryonic structure suffer in consequence. The Creator has in His wisdom provided the amount of water necessary for the proper growth and development of the embryo, and also for any loss that may arise from natural evaporation during that period. The moment we attempt to take any from it by any means whatever, we rob it of that which it needs, and it suffers in consequence. Some writers would have us believe that successful hatching depends upon our ability to evaporate the egg to a certain degree in a given time, and even furnish us diagrams to guide us. A strong healthy germ will utilise the entire contents of the egg in its structural development, and the waste products resulting will be cast off as Nature provides. This is what should enlarge the air-bulb; any other means used to attain this end are unnatural. *Supply only the necessary oxygen to sustain life*, with the proper degree of heat, and the fundamental conditions are secured, and the moisture will take care of itself.

"A good incubator is very essential to success; cheap machines, like cheap watches, are unreliable, and in the end the most expensive."

Valuable as the above practical hints are, some experience and judgment are needed before applying every one of them unreservedly to circumstances in England. Reference has already been made (see pp. 79, 80) to the differing thermometric readings in various machines, which must be ascertained and allowed for; and it is manifest that keeping the temperature at 99° near the glass front, in vacant rows, while it may be a good and sufficient rule for large machines built on one general plan, and which upon an average will have to "test out" a considerable number of eggs, must be very uncertain, and might be quite wrong, in other cases. It is of course understood that 99° in such a vacant position, in the coolest position near the glass front, is equivalent to a proper heat over the eggs farther back: but in a small 50-egg machine, with a spring batch of eggs all or nearly all of which were strongly fertile, a thermometer so placed might be nearly up to the egg-temperature, and therefore too low. Intelligent operators will, however, consider such points as these, and notwithstanding find hints of value from such a skilled exponent of American practice.

It should also be remarked that duck eggs are, as a rule, longer hatching-out than hen eggs. The latter often come out six hours after pipping, generally before twelve, and seldom later than eighteen. Duck eggs are, in England, hardly ever less than twelve, and often twenty-four. and even more, hours in getting out. They can, however, be "assisted" with more average success than with chicks. It is remarkable that American experience also differs in this respect, strong duck eggs coming out as a rule more quickly than with us, so that here again we have to "level up" to trans-Atlantic practice.

Turkey and goose eggs are also generally thought to hatch better with a little lower temperature than hen eggs; but experience in hatching either has hardly been sufficient to settle the point with certainty. Experimentally, both have hatched with entire success; but it is not so easy to rear poults artificially as with a mother, and goose-breeding also appears to "work" best in the natural way. It is curious that ostrich eggs are hatched in incubators far more largely than either. Hydro-incubators were very early used for this purpose at the Cape, but have since been superseded by modern British machines built specially for the purpose. The Phœnix Ostrich Farm in Arizona, and the Florida Ostrich Farm at Jacksonville, in the latter State, use an American machine; and, with the aid of incubators, ostrich-culture seems extending.

It does not answer to hatch together eggs too different in size. One reason is that the smaller egg not only holds less heat in itself, but has more evaporating surface in proportion, and therefore dries out the air-cell at a different rate. In many machines, especially of the Hearson cool-bottom construction, the temperature of the top side of the large eggs would be one or two degrees higher than of the small ones, and this also would impair results.

When a hatch is complete, it is well to open, air, and if necessary, disinfect the machine. This may need it, owing to dead germs having been left in too long, and occasioning a musty smell. Where moisture trays have been used, they should be scalded with boiling water, and any earth or sand used in the egg drawers well baked, to kill any bacteria which may have been introduced. The trouble of doing this comes but seldom, and is very little; it often perceptilby affects the next hatch. When a machine is discarded for the season, if it has a tank, this should be quite emptied, and the whole of the interior carefully wiped and cleansed out. Hot-air flues and radiating chambers should likewise be cleared from soot, which is more or less acid, and if left in cold machines will eat away the metal.

It may be said, in conclusion, that while incubators are not for the slovenly, idle, or capricious, where they are taken seriously and managed in regular business-like fashion, they bring out upon an average a better per-centage of fertile eggs than hens. In America that has been settled beyond dispute, by averages calculated from thousands annually. So much is this the case, that in that country it has worked a profound revolution in the poultry industry. Where eggs were formerly sold by the sitting, the great majority are now sold for hatching at so much per hundred, while some hatchers contract by the thousand. The effect upon the spread and popularity of non-sitting breeds has been enormous upon both shores of the Atlantic. Upon both sides of that international pond has also been developed a considerable trade in newly-hatched chickens, sold per dozen, or score, or hundred, and sent off to the purchaser before feeding, at from eighteen to twenty-four hours old. Such are practical proofs of the undoubted success now attained in artificial incubation.

Hen Turkeys as Incubators.

At this date it is not necessary to do more than mention briefly the artificial system of hatching continuously under hen turkeys which is still carried on to some extent in France, though less than formerly, but has not now, we think, been employed in England for many years. Mr. Geyelin reported in 1865 that some of the *couveurs*, or professional hatchers in France, had as many as sixty turkeys sitting at once, the birds being fetched in from the yards at any time when desired, placed upon nest-eggs, and shut down under a lattice cover. For about forty-eight hours they struggled more or less to escape, but then settled down, and afterwards would be kept sitting for three months or more, the chicks being taken away and fresh eggs substituted. The birds were taken off once a day to feed and to clean the nests; they ate but little, and became very fat, and after a time had to be given sufficient food by cramming. When a bird had been sitting for some time she could be made into a foster-mother if desired, being given a glass of wine at dark, and an hour or two after chickens placed under her, which she would take to in the morning.

This system was at one time employed also by English breeders to a small extent, but it never appeared so successful as in France, owing perhaps in part to differences in breed and climate, but probably more to want of experience and aptitude, which in France had been hereditary for generations. Advances in artificial hatching and rearing have made such methods—in England and America at least—now matters of only historical interest.

CHAPTER VI.

REARING AND CARE OF CHICKENS.

We have seen that Nature has provided the newly hatched chick, beforehand, with ample nutriment for at least twenty-four hours. It suffers little deprivation from thirty-six hours' abstinence, and for it to partake of food within less than twelve to eighteen hours after a healthy hatch, is rather prejudicial than of any benefit. Considering first a brood hatched at the natural season under a hen, supposing her to have been set at night, and that the eggs were fresh and strong, some of them will have been hatched by night, and at the final examination the shells from such will have been cleared away, and the hen shut in, feeding her, perhaps, if she will take food. By morning the rest will probably have hatched, and the whole will be strong and lively. Unless any unhatched eggs are valued, and probably stale, it is generally best to be content with what are then out; for the hen will be getting restless after having had nestlings under her all night, and any hatched later will be weaker than the rest. Of course, if the sitting is variable in age, such a rule might lose half the brood; then the best plan is to take away what are hatched, and keep them in flannel by the fire while the other eggs are tried out; or this is just the time when a small incubator may be very useful to many who never hatch artificially upon system, as it may be heated up in readiness, and late eggs put in to finish, while the rest of the brood is not injured. As a general rule, to keep a hen fussing over a few unhatched eggs is apt to be prejudicial to chickens which have hatched in good time, and may result in "throwing good ones after bad."

Care of the Hen.

The first thing to do when hatching is over is to give food and drink to the hen, as much as she will take. Part of her meal may be barley or wheat, and part good mash; or wheat may be mixed in hot soft food, and given when cool and a little swelled. She will be quieter and more easily managed if thoroughly satisfied at the outset after her long fast. Next comes putting her and the brood out, which is generally the best plan at ordinary seasons and in fine weather; sometimes in cold or wet weather it is better to feed the chicks also on the nest, and keep them there till the warmest part of the day, or even a whole day if the hen is quiet and will stay there. The food in such case can be placed on the front part of the straw, beaten down rather solid for the purpose; but care should be taken that no birds can fall outside on the ground, as they cannot get back again and may perish.

Egg-food.

The best food for the first day we still think to be hard-boiled egg finely minced, mixed with equal quantity of stale bread-crumbs, and slightly moistened with milk. It has been common to feed for several days upon this egg-food, but bad results have so often followed this kind of feeding that it is now discarded after the first, or at most second day, by experienced breeders. Such continuance usually causes constipation; and then from reaction and want of digestive activity the opposite evil follows, and the chicks may die. This is the true history of a great deal of trouble with very young chickens, though aided in many cases by constant pampering with tit-bits and dainties. Egg is indeed very strengthening and useful for young and weakly chickens, but is better beaten up raw and used for moistening the food; or it may be beaten up with milk and fed as a slightly baked custard. In this latter form egg will often bring on wonderfully the backward ones of a brood, but should never be given to such an extent as to make them dainty over plain diet. The late Mr. John Douglas used to give custard to his Game and Dorking chickens for the first meal in the morning till several weeks old, and attributed their rapid growth to their getting this rich diet the first thing in the morning. He beat up three eggs in half a pint of milk, and stirred in a saucepan over the fire till it became a thick curd. The whey was then squeezed out through a cloth, and the squeezed custard given at first by itself, and after a few days mixed with coarse oatmeal. This is the best way of giving egg-food, and in this form once a day it has no bad effects.

There are still ignorant people who think it necessary to remove the pointed scale (provided by Nature as a weapon to break the shell, and which falls off by itself after a few hours), at the tip of a chicken's mandible, or put a peppercorn and a few grits down its throat, or dip the beak in water to "teach it to drink." Anything of the sort can do no good, while it often causes pain, and may do real harm. Play no such tricks with the young and tender beaks, but simply offer the chicks food. Some of them will not care for it, while others may eat a little; but if they are fairly upon their legs and look happy, not the slightest anxiety need be felt about any which neither eat nor drink the first day. Nature herself has prepared and provided for such a state of things.

Coops.

How the brood is cooped out will depend upon circumstances. Under a shed with a dry floor of earth or gravel, or the floor of which is covered with an inch of earth or ashes, the old crinoline-pattern round basket-coop will answer very well, the shed giving the shelter. We have often used several such coops side by side under a shed, which should open or have a door at the front to an open run, best of all if a grass run. Where there is no such auxiliary shed, which forms an important part of most establishments of any size, the coop itself must be so constructed as to give sufficient shelter, and such can be made or purchased in endless variety. The most primitive is that shown in Fig. 51, which we only illustrate because it is still much used throughout the poultry-raising districts of Hampshire, Surrey, and Sussex, and has been extensively copied from thence in other districts, with mischievous results. It is cheap, easily cut up and nailed together, and when one is reversed upon another, two pack in little space. But the shelter afforded is not nearly sufficient for ordinary circumstances. It is a form essentially adapted for roadsides and hedgerows, or under trees, which give the shelter the coop itself lacks and where it can be moved daily on to clean and dry soil. Chickens reared under it in such circumstances, and at perfect liberty, grow up healthy and hardy; but, lacking these advantages, the brood gets wet and the ground damp and foul, and the results are disastrous. But even in the districts named this form of coop is not now used so much as formerly; and where shelter and dry soil and unlimited fresh ground are lacking, we must adopt other means.

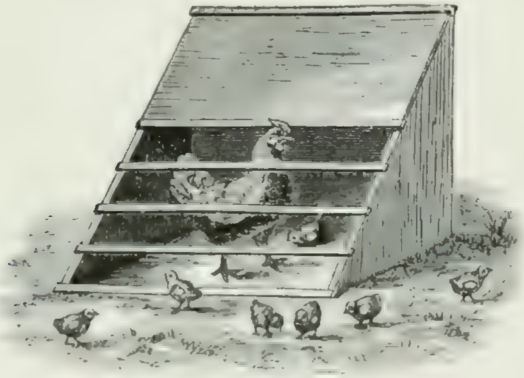

Fig. 51.—Sussex Coop.

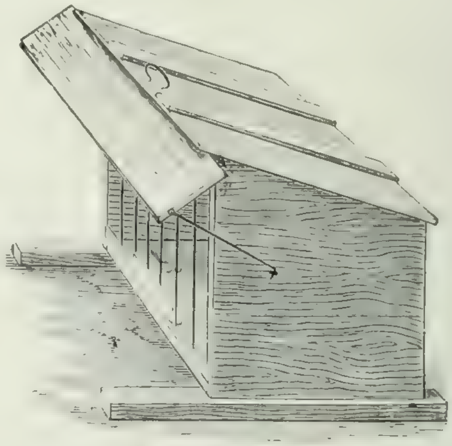

Fig. 52.—Shelter Coop.

The best coop is a weather-tight one, with a separate raised and internal wooden floor, the latter, of course, to be covered with soft material kept clean daily. Nearly forty years ago, in the early days of our poultry-keeping, we devised for our own use the coop and floor shown in Figs. 52 and 54. At that time nothing of the sort could be obtained; but the merits of this coop were so self-evident, that it was not only much copied by other breeders immediately upon publication of our sketch, but the general design has been widely adopted, with occasional slight variations, by all manufacturers of poultry appliances. Any of these such coops can now be purchased at a cheap rate; though these are in most cases somewhat smaller than we advised. We preferred, for hen and chickens alike, a rather large coop, and made all our own two feet square. The two principal features of this coop were the internal wooden floor, and the additional shelter-board in front. The dimensions given will cut up all the wood without waste and with the least amount of labour; so that with the materials at hand, we cut up the timber and finished three of these coops, personally, in one Saturday afternoon, with the sole exception of an external coat of tar, which they received on the next possible opportunity.

The materials required are boards half an inch or more thick, and the usual size of twelve feet by nine inches; a few feet of 2 × 3 "quartering"; and a few feet of stuff about an inch square for the corners. Most of the boards are cut each into six two-feet lengths; one for each coop must be cut into *five* lengths, for the roof, which is not only on a slant but is meant to project a trifle all round over the sides. Each side requires two whole boards (two feet long) and a half-board cut diagonally; the back two boards; these are nailed to corner-posts cut off the inch-square stuff, two pieces of the same being also nailed across the front at top and bottom. The roof-pieces are nailed on, slats cut from one of the same longer boards being tacked over the joins to prevent leakage. The fifth longer board makes the loose shelter-board for the front. This might be hinged; but we preferred to make it detachable, driving two small wire staples into the under side of the front edge of the roof, into which could be hooked, or released, two small hooks driven in the edge of the board. A small wire stay kept the board in position. The front of the coop can be made of thin slats, one of which is movable, though we used thin galvanised wire as shown, because we happened to have a lot of it on hand, left over from some operations in a curiously different line of work.

The chief modifications made in this coop since, relate to the shelter-board, which by many makers is hinged at the top, and made wide enough to come down entirely over the front, and shut all completely in for the night. The extra width is good, but whenever shutting in is necessary, on account of field vermin, it is a necessary evil, and ample ventilation holes must be provided. The most complete shelter we have yet met with is provided in one of the designs supplied by Spratt's Patent under the name of the "Gamekeeper's" Coop, at a cost of about 9s. and shown in Fig. 53. In this coop two side shutters entirely close in the front when shut and fastened, the slope at their tops giving a space for ventilation when closed. The shelter-board is made very wide, and is not hinged, but *draws* out through a loose slide, falling loosely down so as to rest upon the opened shutters. There is thus great protection both against the heavens above and the strongest side-winds below, and such a coop affords sufficient shelter for the most exposed situations. There is really more than is necessary for any that is not exposed.

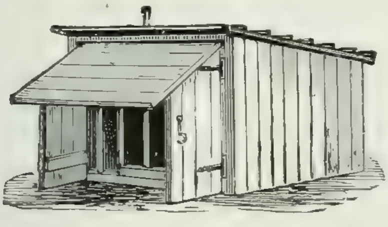

Fig. 53.—"Gamekeeper's" Coop.

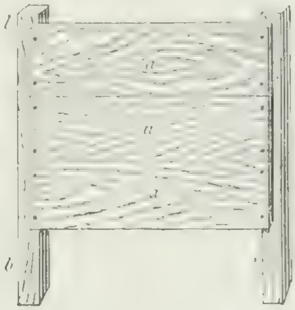

Fig. 54.—Floor of a Coop.

Dry Floor for Coops.

The other distinguishing point of our coop was the floor. There can be no doubt at all that where the soil is dry, and a coop can be shifted its own width daily on to fresh ground, no better plan can be adopted. Especially is such the best way of rearing not only pheasants, but one or two of the wilder breeds of poultry, such as Anconas, which seem to preserve somewhat of the same wild constitution. But cases are rare amongst ordinary people where this can be done; and generally other means must be adopted to ensure a clean and dry floor underneath the brood when nestling under the hen. The best method is a raised inside wooden floor, which we provided for very simply in the coop figured above, as shown in Fig. 54. Here three half-inch boards *a a* are nailed to pieces of 2 × 3 quartering *b b* in the manner shown, so as not to reach the edges. If they are cut the proper lengths, it will be readily seen that the coop fits or sits down *outside* this floor, on the space left of the two timbers. If any of this foundation projects still farther beyond the walls of the coop at all, it should be sloped away, so as not to retain any wet to run under the walls. Such a floor stands up several inches clear of the ground, and must remain dry in any weather. The pieces of quartering are left projecting in front on purpose, in order that a loose piece of board may be placed on them in front of the coop, to serve as a feeding-board for the chickens.

A floor of this kind can be made to fit any coop of whatever construction, and will save much trouble. It must be covered with loose, dry material, which may be earth, or chaff-dust, or peat-moss litter. This should be either renewed or thoroughly cleansed at least twice a week. The best way to do this is to rake out all the litter in the morning, and give each coop a very slight sprinkle merely to keep the wooden floor clean. Then in the evening a bed should be given at least a quarter of an inch deep, or half an inch would be better. At night the hen and her charges will settle down, and not, as during the day, at once proceed to scratch the newly-made bed outside of the coop. Another good plan, perhaps best of all in cold weather, is to bed on straw-chaff as the top litter, as this material, besides being warm, can be easily removed when it becomes fouled.

Cooping the hen with her chickens has been condemned by some who have written on the subject without much practical knowledge, and who have alleged that the "natural" plan of allowing her to wander at will with them is to be preferred. We have tried both ways, and assert without hesitation that this notion is altogether a fallacy, and that a brood placed with a hen properly cooped, with a moderate and fresh grass-run, well sheltered if possible by a few shrubs, and regularly supplied with suitable food, will thrive better and grow faster than if left at liberty. Game and Aseel, in which size is no consideration, but hardness of flesh of great importance, may be exceptions, and do well with free range: but nearly all hens over-tire their chickens if left to their own discretion, and from this most chickens suffer severely, besides being often surprised by showers where there is no adequate shelter.

Diet and Meals.

After the first meal or two of egg-food, the chicks will have to be more regularly fed: and indeed there is not the slightest need of egg-food at all. We have reared many which had no food at first except whole groats (the grain of the oat with the husk removed, often called "hulled oats" in America) cut with a knife, and bread-crumb moistened with milk. Some of the "patent groats" are as coarse as chopped groats. Whatever be used, newly hatched broods learn to peck best and quickest at something *white*, whatever it is, according to our experience. They should be fed partly upon meal food, and partly upon dry seeds or grain; and the result of many years' chicken-rearing convinced us that it was best, for stock birds, if the two alternated. For fattening and killing it is different; but unless there is plenty of grain food, the chicken's gizzard is not brought sufficiently into action for really vigorous health. Indeed many find that they are more successful in rearing upon dry food alone for the first four weeks, as mentioned on p. 104. In regard to frequency of meals, at first one should be given every two hours. This may continue for two or three weeks; but by a month at farthest the time should come down to every three hours or so; and at ten or twelve weeks to four times a day. Chickens will live and grow up very healthy with less than this; but we are here discussing their rearing to become large birds, yet with health and vigour. More than this interferes with the latter condition, and it has been proved does not increase real size.

Food will, of course, change with growth; small, tender beaks cannot manage at first what might be splendid food for grown birds. For the first start off, perhaps the best soft diet is a mixture of stale bread-crumb with coarse oatmeal, which may be moistened with skim milk, or for the breakfast with the custard before described. In cool weather even whole milk may be used, but the skim is better. Sour milk does not answer for chickens as with fatting fowls. Where there is no grass run, upon which chickens soon learn to help themselves, green food should be cut up very small and mixed with this, before the water or milk is added. Take a good wisp of fresh clean grass in the left hand, and with strong scissors cut it off into small green chaff less than a quarter of an inch long. A teacupful of this, one of stale crumbs, and one of coarse oatmeal may all be mixed together dry, and will last a large brood for a day, moistening a little as required. Rather thick porridge is also greedily eaten; or cooked porridge may be mixed with sharps or a further portion of dry coarse oatmeal. After a day or two chicken food, prepared in the form of good biscuit meal,* may be mixed with the bread-crumb, and next day quite supersede it; and as the beaks gain in power, ground oats may supersede oatmeal, or be given alone, but is kept more friable with a little biscuit meal. Later on, sharps and barley meal may come into use, and any other good change of meals will find a place, such as sharps and biscuit meal, or a mixture of bran, oatmeal, and maize meal. It is during early days that whiter and softer materials are advisable; but oatmeal and ground oats stand out in feeding value to the end. We would give a special caution against barley meal for very young chickens; they cannot digest the husk, which passes out and causes irritation at the best, but sometimes collects into an impacted mass and causes death. The same is the case with ground oats if not properly ground.

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* We here use biscuit meal as a general term for any of the prepared foods which are baked into rough biscuits and then granulated. In America, breeders very largely mix their raw meals and bake it themselves into what they call Johnny-cake, which is then crushed, and forms very similar diet.

Green Food.

Green food must be kept up all through chicken-rearing. Finely cut grass has been already mentioned; if this cannot be had, cabbage or lettuce may be minced small and used in the same way. Or mustard and cress can be kept growing in a couple of boxes of earth, or a little rape. Dandelions make excellent green food. We have occasionally known them refused at first, but once used to dandelion leaves most fowls prefer them to all other green food, and they are so wholesome as to be well worth growing from seed where many chickens are reared. Seed may be sown in the autumn, thinning the plants out, when they come up, to about a foot apart. Also sow again about March. These two sowings will last all spring and summer, and will last two years, when they should be superseded, in order to keep the leaves tender and succulent. Care should be taken, where dandelions are grown, to cut off the flowers regularly, or the seed will become a nuisance and pest to all the neighbours. Chopped onions and leeks are very wholesome, and nettles are also good, but require to be boiled. Best of all is a grass run, if clean and sweet. The chickens will then help themselves when a few days old, but should have the cut grass or vegetables as above for nearly a week, until their beaks are strong. The constant and free use of grass or other green food is the great safeguard against bowel complaints in chickens. A free supply after deprivation will, of course, often cause diarrhœa; but a constant and ample supply is the great and natural regulator of the system, maintainer of healthy appetite, and prophylactic against liver disease.

Where space does not allow of a really open grass-run for chicken-rearing, but is not excessively confined, and the soil is suitable, we have seen great benefit from an ingenious plan adopted and described by a correspondent of *Poultry.* Two or more frames are prepared—less than three are scarcely worth while—of 2 by 3 inch quartering, two feet wide and three or four feet long, and covered one side with inch-mesh wire netting. The ground being first prepared, is sown with suitable grass and clover seed, and covered with these frames, the netting uppermost, and thus raised two inches above the ground. All is fenced away from the chickens till the grass and clover under one frame is sufficiently grown, when they are allowed access to one, and pick at the green food through the netting, but cannot trample it down or scratch it up, and foul it much less than if allowed to walk over it. When they have fed down one frame, it is fenced off and another left open; then the third, and the rest if more in number. By this time the first frame will have made fresh growth, and in this way much real help may be obtained. We have also known six-inch strips of ground fenced off by perpendicular wires 1½ inches apart, which allowed the chickens to pluck the grass, but not to walk upon or contaminate it. Such strips should be manured (with poultry manure) during the winter months.

Feeding on a Board.

After trying various methods of feeding, we still think best of all for the young chickens, while with the hen, a smooth board in front of the coop. We always laid this on the projecting ends of the timbers in Fig. 54. Vendors of appliances say that such boards cannot be kept clean, or get "sour"; that was not our experience during many years. For people who prefer them, there are all sorts of troughs and other things. We think it best to rather scatter the soft food on the bare board, to which it will not adhere if mixed in a properly friable condition. After the food has been placed on it, a moderate time should be allowed for the chicks to eat all they really care about. Then whatever remains should be at once removed with the scraper shown in Fig. 55. This scraper is also the best implement for cleaning the coops, and should be freely used. By it all remains of the meal are scraped off the wood into a dust-pan, a little coarse sand being strewn upon the board after, a portion of which is meant to adhere to and be eaten with, the next meal of soft food given.

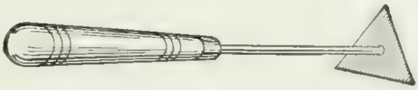

Fig. 55.—Scraper.

Grit for Chickens.

Many experienced breeders think this sanding of a board not sufficient, and advise a little carefully sifted grit (for which some of the smaller flint-grit should be sifted through a wire sieve which will just allow millet seed to pass easily) to be given once a day, with one of the soft meals. Much will depend upon the chicken run. Where this is ample and grit abounds, to mix it in food can hardly be necessary. Otherwise it is safe, and can do no harm, and in a small space is really needful for the chickens. In all cases, a supply of small grit should be kept well scattered around the coop. Our experience has been that a saucer of it is not sufficient.

At a later stage, where there is ample range it is better to avoid all boards and vessels whatever, scattering the grain broadcast as it is, so that none may be bullied out of their share, and kneading the mash or meal into lumps the size of cricket balls or a little smaller. These also are cast about, and break when they reach the ground; a ball of meal food that holds well together, and thus breaks up without sticking to the ground, is mixed right, and is how meal food should be prepared. It is to get this consistency that we like to add a little sharps, or even maize meal, to ground oats or oatmeal, which are the most difficult to mix in a friable state. Such balls are thrown here and there so long as they are eaten up promptly, and no longer. But this method of feeding requires both space and time. Pans may be used in default of space; but *time*, to see that they get enough and not too much, is really necessary to rearing fine chickens. At the same time, they can be looked over and note made of any that need attention. Where time is wanting, it is better to give rather too little food than too much.

Grain for Chickens.

The seed or grain portion of the diet will also have to be adjusted during the early and tender days, after which it can be more varied. Whole groats, chopped smaller with a knife the first two days, then given whole, may be varied by such small seeds as canary and millet with advantage, and such seeds might indeed be continued *ad libitum*, were they not too costly. When millet is fairly cheap it is worth its price. But after a few days we can introduce for a change cracked wheat or barley, or even cracked maize, for young chickens are so active and grow so fast that, in moderation, little need be dreaded from maize at this age. Then they will come on to whole wheat, buckwheat, and now and then a feed of dari; but there is too little substance in the latter to recommend it often. Care should be taken that chicks do not gorge themselves with wheat, as it swells in the crop, and may so cause mischief. A little sunflower-seed is much relished at times, chopped or cut if too large, and is much safer than hemp-seed, as well as more nourishing. For the reasons already given as regards fowls, it should be arranged that the last feed at night consist of dry seeds or grain.

To rear fine birds there is one simple rule. The meals must be far enough apart for real appetite to return, but not so far as to check nourishment; and enough must be given to fully satisfy the appetite at that moment, and *no more.* The chickens must not really be left to hunger; neither must any food be left by them, after they have eaten what they want. It is well to gratify the appetite by judicious changes. Such changes make food to be more eagerly relished and better digested; but the golden secret lies in the above, and in all the food being nicely prepared.

Feeding at Night.

Early chickens, for either exhibition or market—let us say if hatched much before the middle of April—require extra feeding and attention, to cope with the cold and the shorter days. The meal may be mixed with milk, or skim milk, so long as cold weather lasts, or a drink of warm milk may be given in the morning. Care should be taken to feed them as soon as ever it is light enough; and they should have an extra special feed by lamp-light, at nine or ten o'clock. Early chickens especially need this extra feed, and it makes an immense difference to them. The first time or two, the hen may have to be lifted or stirred up; but they rapidly get to understand the business, and run eagerly out from under her as soon as they see the light of the lantern. Groats or wheat are the best for these last feeds, and a little may be left for them to peck at first thing in the morning.

Animal Food.

Animal food should not be forgotten, unless a wide range gives them plenty of insects, when it is not really necessary, though even then a portion helps growth, and early laying if eggs are in view. For the first week, lean cooked meat finely minced or shredded is the proper thing, and for a single brood a small slice from the house, or a piece about the size of a walnut, cut up very small, will suffice. In dry weather this should be scattered on the ground in front of the coop and board, that the hen may not get it, and the chickens may all get their share, and run about in getting it. Later, any cheap sound stuff bought for the fowls will do, or one of the many kinds of granulated dried meat sold as "crissell," "meat meal," or by other names. These should be soaked a little in warm water before being given, and if any sample should be accidentally found offensive, as may happen to any brand now and then, it should be discarded. Not till they are at least a month old should they have green cut bone, if that is used for the older fowls; before that age the latter is apt to cause bowel disorders, and even then chickens seem more prone to this result from cut bone than laying hens appear to be.

In regard to water, where this is given the best plan is generally to place a small fountain on one end of the feeding-board, where the hen can reach it as well as the chickens. Care must be taken that it is always fresh and clean, and the fountain shaded, as sun-warmed water is apt to cause purging. But an important question has been raised as to what should be allowed chickens in the way of drink. The usual plan till lately has been to let them have water by them *ad libitum*, the fresher and cooler the better; and we have shared this general practice with others. There have, however, always been exceptions to this rule amongst country rearers, especially some who have inherited traditions of Game-fowl rearing; and during the past few years there have been on several occasions lengthy discussions as to whether it is not better, for about the first five weeks, to withhold water altogether, where the chickens are fed chiefly on soft food, except so far as fluid may be contained in the latter. A careful and exhaustive analysis of all that we have been able to meet with on both sides of this question, has led us to the conclusion that the preponderance of experience is upon the side of withholding water. It is to be remarked that by far the greater part of what has been said on this side, consists of actual evidence as to extremely good results from this mode of treatment, and in many cases of very great improvement in rearing after its adoption. On the other side, a very large proportion of what has been said against it consisted of mere declamation against the supposed "cruelty." It need not be pointed out that there can be no real "cruelty" in any course of treatment which rears more chickens, if the fact be so. And when appeal is made to "Nature," and we begin to think about it, Nature herself is, if anything, rather on the side of the dry method. The young of all small birds, at least, are reared without water. The fowl itself is believed to be an Indian bird of the jungles; and in such localities it is certain that even the old birds can only drink at long intervals, while days must often elapse before young and tender broods can thus indulge. How much less can water be really required where a large portion of the food itself is mixed with fluid, as in our artificial rearing?

Water for Chickens.

At all events, there is a considerable body of evidence to the effect that a large amount of the diarrhœa and other bowel complaints of young chickens is due to unlimited supplies of fluid in addition to soft food; and that many have left off giving fluid with marked advantage. Some have deprived the chickens of drink entirely for the first month; others have allowed one fair drink in the morning after breakfast (preventing any excess), and then taken it away, giving the hen drink separately. The chickens in most seasons get some drink from the dew upon the grass, and in these small quantities it is probably less injurious to them. They can be seen drinking in this manner; and the fact suggests that some little should depend upon the season. Where they are hatched late, and the weather is hot and dry, such a regimen should not be insisted upon, especially if fed chiefly upon grain, though even then we are convinced that "water by measure" will be the best plan. But in spring, or where soft food is given largely, we are disposed to think that no water in addition, or only one drink after breakfast, and possibly a few sips, and no more, at night, will be found the best regimen.

The only actual evidence we have seen of any evil from this course, was when the objector had adopted it with chickens a few days or more old. That is natural: such changes should not be made with young things of any kind. Those once accustomed to drink, must suffer by deprivation: and if any change is made, it should be very gradually, and not carried to the extreme. The very worst effects of all are produced by allowing young birds to drink to repletion after prolonged thirst. But it has been noticed that chickens reared on the dry system are much less prone to this in after life.

We may now pass from feeding to the principal difficulties in chicken-rearing. Some people find one of the greatest from cats, which often make dreadful inroads upon the broods. While very young, a brood can be easily protected by making a few hurdles of inch-mesh wire netting tacked on light wooden frames, two feet wide and six feet long being a handy size. These are easily lashed together with string to form an enclosed run, covered entirely in by similar hurdles, and the coop fronts into this run. They will be quite safe so far, and can be thus confined for about a fortnight, provided the whole be moved to a fresh piece of short grass every day, or at most two days, or an earth run cleansed conscientiously. After that they suffer. A single grass-run forty or fifty feet square, if well mown, attended to, and managed, will rear in succession a great many chickens during their tenderest age, and both in Bristol and London (for we have had painful experience of the feline tribe) we found practical protection by enclosing this in a wire fence six feet high; only wherever there was a piece of wall or shed as one of the boundaries, it was necessary to carry a yard of netting above that, next the yard, so that the cats had to do their walking outside of it. They never seemed to understand, looking down as they did, that they could get over by climbing *up* this strip. Out of many former offenders, only one cat in Bristol and one in London climbed our netting, and both these met an untimely end—

Cats.

not unreasonably, after the pains and expense we had incurred, and considering that we had "stood it" to the tune of over a dozen Brahma chickens. Cats are easily caught in a trap made just like a box mouse-trap. In two cases, before our fencing was put up, we found that energetic treatment from the hose of a garden engine made more extreme measures unnecessary. But others braved even that rather than forego the delicacy of live chicken.

The more common difficulties in rearing chickens are *insect vermin*, *bowel complaints*, and certain affections of the feet and legs generally known as *cramp*, the last specially attacking those hatched at unnaturally early seasons. If it is understood from the first that all three are very common dangers, very much will be done already towards warding them off.

Insect Vermin.

Insect vermin ought not to trouble any poultry-keeper who only rears a brood or two in the year. Supposing cleanliness and disinfection properly attended to in the stock and house, he need not be afraid for any of his hens; and if a borrowed or hired one has been set, she should have been examined and treated beforehand, as already recommended. Still he should be careful; and it is as well to give the hen a thorough dusting with *pyrethrum* insect powder before putting her out with the brood. That should be enough. But as stock is multiplied, it becomes more and more difficult to fight the insect fiend; and whenever chickens appear not to thrive and grow while with the hen, yet no definite ailment can be found, in most cases the cause lies here, and both hen and chickens should be rigorously examined. They may probably be found infested with insects of various kinds, not all amenable to the same treatment.

Fleas, if found at all, are very unusual, harbouring more in houses than upon the birds. *Lice* are most common, and will be found chiefly under the wings, on thighs, round the vent, and round the throat. A thorough dusting in of insect powder, all over every bird once or twice, will usually be sufficient, or powdered sulphur, carbolised,* letting the hen also have access to sulphured dust-baths frequently. Besides this the chicks may have just a touch on the places named, and on the top of the head, with oil or vaseline containing a few drops of paraffin oil. This will keep them reasonably free, and lice are only injurious when in numbers, from the irritation they cause. Far worse are *ticks*, which attack chickens more often than is supposed, and are believed to reach them not only from an infested hen, but from other animals. The tick is a large insect in comparison, which half buries its head in the victim's skin, and sucks its blood, both the pain and loss of vital fluid causing the chick to pine away. Ticks will not be found, like lice, on the under parts of the body, but solely on the head, throat, and top of the neck. Neither do they swarm like lice, but must be looked for singly and with great care, every point of head and throat being gone over. If all can be picked off, it will probably be sufficient for a single brood, but will take much time and care; and it is better to apply a dressing of one ounce mercurial ointment, two ounces lanoline, and half an ounce paraffin oil. This is applied scantily but thoroughly to the skin over the head, with a touch under the throat. Some prefer a wash made by boiling three parts of water, and then stirring in one of paraffin oil, applying thoroughly with a rag but not drenching the plumage. When there has been former trouble with ticks, it is best to apply the above ointment within the first day or two, which will prevent trouble. It is to be remembered that mercury is poison, and though careful application diluted as above will do no injury, any excess in quantity might do so.

The *red mite*, so dreaded in fowl-houses, can only attack chickens by gross neglect, or if they are confined at night in the house, as it lives generally in nooks and crannies, and only visits the birds to feed. A little oil mixed with one-fifth part paraffin oil, applied at the neck, under wings, on thighs, and near the vent, will be some protection; but these creatures must be fought chiefly in the house itself, where they live and breed. A coop should be quite free, and easily kept so.

Bowel Complaints.

Bowel complaints very often cause loss and trouble, the more so where many are reared. The unwise use of hard-boiled egg has already been alluded to as apt to cause mischief; and the want of ample and regular green food is another frequent cause, as is also a lack of sharp grit. Green cut bone does not necessarily occasion such complaints; but there are so many cases where it appears to have done so, that we included it amongst our cautions. Avoiding these known occasions of such mischief, bowel complaints should seldom occur; but wet or chill, or occasional sour food, or over-crowding, or unknown causes, or accidental circumstances, may notwithstanding set up a diarrhœa, which is disastrous if not checked at once. In any case it should be treated immediately. Very young chickens often get quite plastered up around the vent, causing much distress, and death unless relieved. Such should either be washed or the dry matter picked off, bringing the down with it, after which the part should be well greased with vaseline to prevent adhesion. For mild cases it is often enough to give a feed or two of rice boiled in milk, rather dry but not hard. When known to be caused by wet or chill, a drop of camphor essence at every feed is often of the greatest service. More serious cases are best treated by chlorodyne, giving two drops for a three days chick, up to five drops for ten days or a fortnight, every two hours for a few doses, then every three hours till distinctly convalescent. Meantime the diet and surroundings will be carefully examined, and anything that seems wrong effectually remedied.

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* Powdered sulphur rubbed up with a little carbolic acid, without losing its apparently dry and powdery condition.

Cramp in Chickens.

Cramp, as it is called, is specially found in the case of early chickens, but includes several complaints more or less distinct. The symptom common to all, is failure of power in the legs, with or without swelling, or contraction of the claws. The limbs seem to get stiff and weak, and the chick rocks or rolls in its gait. Then the claws may so flex, that walking takes place on the knuckles if at all; finally death ensues. Whole broods are lost in this way. The connection with cold or wet in early seasons is plain enough as a general rule; and when these are the sole causes it is simply a case of rheumatism, to be treated by warmth, gentle friction of the limbs and claws, and hot bathing of the limbs, with any of the stimulating liniments advertised in the newspapers, and a grain or two, twice a day for each chick, of salicylate of soda. But this simple case rarely occurs, and if it does is such a symptom of debilitated constitution, that cure for the time is scarcely desirable; birds so delicate are better dead before they can propagate their weakness.

There are other cases in which the chickens have run upon a wooden, or brick, or stone floor. Here the connection with the season is indirect: the chicks were confined for protection upon these hard and even floors. This strains the muscles, and the result is a sort of cramp, in the true sense of that word. The only remedy in such cases is ample loose material, at least an inch deep, over the entire hard floor, an open run outside, and keeping them short enough of food to make them run constantly. The soft floor, open runs, and the actual running are the main points, and, if taken in fair time, will generally cure. In these cases there is not necessarily constitutional weakness to be dreaded. Mere dry cold is not at all a drawback to rearing chickens: it is wet or wind that does mischief. In Scotland and America, where the cold is far greater than in England, greater average size is attained, though more food is consumed; and excessive heat in summer will do more harm than cold in spring.

But the greater number of cases are distinct from either of these, and are due largely to *overfeeding*, especially if much meat be given. This cause may be no doubt aided by too much coddling, or a hard floor. The latter may tend towards the real cramp noticed above, while overfeeding accumulates poison in the system, and the birds are lazy, and take no exercise to work it off. It is more like gout than anything, in reality; and every doctor knows that rheumatism and gout are close allies, both being connected with accumulation of uric acid in the tissues. Here, too, the connection with cold and wet is indirect. The chicks get more and richer food to withstand it, and are lazy and chilly, and nestle more under the hen than they would in warm weather. Hence the mischief. The salicylate will be the best medicine, combined with two or three grains of Epsom salts, or potass bicarbonate; and rubbing with liniment, best of all one containing turpentine, with flexing and working the claws, will help. But the only real remedy, and the practical preventive, is *plenty of running about;* and the food must be scanty enough to make them run, and come out to search for it. This kind of cramp has often carried off chicks kept altogether in a warm box. It constantly attacks those packed into a greenhouse. If such chicks are taken in time, and put out in the air, in an open run, but with dry ashes or peat moss under foot, and kept just enough starved to make them hungrily active, the cramp disappears: it is *gout* from overfeeding and laziness. Very young chickens, up to five weeks old, should have the best of food, and be sedulously attended to, but always kept *hungrily active.* Such birds are not attacked by cramp, unless the victims of hereditary weakness or disease.

Tainted Ground.

A brood or two, with proper care, may thus be steered through the dangers of early chickenhood; but where many are to be reared, a word of caution is required as to the urgent necessity for *clean ground.* If broods are brought up in succession upon the same spot, the later ones do not thrive like the earlier ones, and may show a kind of falling away that seems unaccountable. The reason is that the ground is tainted. Much can be done by arrangement and care; placing coops, not too close, upon a broad strip of hard gravel or earth, whose surface is rigorously scraped clean. The hard ground will take much of the wear and the droppings, and greatly preserve the grass beyond it. It is better still to have, at the other side of the grass run, another such piece of hard earth or gravel, and to use this alternately with the other, which can be disinfected and covered over in the meantime. A run entirely of hard earth, with plenty of artificial green food, gives less anxiety in this particular way, because it can be regularly swept with hard bristles, scraped, or pared, and dug up now and then. For six years we hatched fifty Brahmas annually, and reared them through chickenhood until the wasters could be picked out, under a shed six feet wide and twenty-two feet long, with an earthen run twenty-two feet square. They were as healthy the last year as the first. But we had the danger ever before our eyes, and averted it by the most sedulous care.

Weaning.

At a period from four to ten weeks after hatching, the hen will seek to be rid of her charges, and what is best to be done will depend upon age and circumstances. If they are well fledged, and of light roosting breeds, she may have a perch two or three feet high, and they may fly up to her; for a night or two she will partially brood them on the perch, and they will know what to do when she is taken away. The heavy breeds are generally best left to sleep in their old coop, where they will nestle together, and will be warm enough at ordinary seasons. Or any large box turned on its side and well bedded with dry earth or peat moss, cleaned regularly, will answer for a sleeping coop under a shed. Small houses and coops are also sold ready made for the use of chickens at this age. In cold weather the sleeping-place should be enclosed all round, and well bedded with clean, straw chaff. If straight breast-bones are desired, chickens of large breeds should not be allowed to roost until well matured; but this question will be further discussed when treating of stock designed for exhibition.

Drafting-out the Chickens.

As they grow up, the chickens will either be absorbed into the other stock of a small establishment, or in larger have to be moved away to make room for other younger ones, and sorted out. In the former case they may still be given extra food by the use of an open wire feeding-coop, in which the special food is placed, the chickens alone being able to get through the wires. In the latter case they will be transferred to runs, and it is best, if convenient, to separate at the same time the cockerels from the pullets. Unless this is done, the heavy breeds never grow so large; and, moreover, a lot of cockerels thus put together early will agree perfectly and give no trouble. An old cock, by the way, may be put with a batch of cockerels whenever breeding is over. He will keep order, and be far happier and more contented than if penned up alone. If, on the other hand, early eggs are an object, the pullets may have a cockerel allowed to remain with them.

Supposing sufficient accommodation, each flock should be made up of birds not very different in age; otherwise, the smaller get no fair chance, and the food itself may not suit all alike; certainly feeding times will not. Care must be taken not to slight any of the older ones for the sake of the younger, but to see that there is *no check* in their progress. If specially good results are desired, now is the time really to study the question of diet for them; for instance, pushing cut bone or meat if early size in cockerels or early laying in pullets is desired, or perhaps checking it if combs have to be kept small or moderated. The food should be most carefully prepared, and judiciously varied. But the old rule of *preserving appetite* must still be followed, or disappointment may follow the most liberal diet.

Bone-dust.

In some circumstances considerable aid may be obtained in chicken-rearing of the larger breeds from the use of bone-dust, or *dry* bone meal, such as is used sometimes in potting plants. This is not to be confounded with green cut bone, and its effects are totally different. The fresh bone, as animal food, hastens laying and maturity. Dry bone meal rather postpones both, if anything, and is chiefly valuable as supplying in an assimilable form bone-making material to fast-growing youngsters, thus assisting sturdiness and preventing leg-weakness. It is also found a very perceptible preventive of diarrhœa; and the careful experiment recorded in Chapter II. has shown its value in supplying mineral salts in cases where much animal food may be undesirable. About an ounce of bone meal may be mixed with each half-pint of dry cereal meals before mixing, the fineness being that of medium oatmeal. Our old friend Mr. John Stuart, of Helensburgh, first taught us the value of bone meal used in this way, and since that time many have proved it. We do not mean that it is in any way necessary to small or moderate sized fowls, or to any ranging over wide fields; but to the great races, reared in confinement, and so peculiarly subject to leg-weakness when so reared, we do know that bone meal is of the greatest use. Burnt bone ground up has not the same effect in all respects. It retains the phosphates, but either in this form they are not so well assimilated, or for some other reason the same good effects do not follow.

Shade in Summer.

Season also requires study in successful chicken management. Valuable as milk is, so long as it can be taken with appetite, in hot weather it seems to sicken many chickens, and should be left off in their food, though perfectly sweet skim milk may still be given in food, or for drink in the early morning, but taking special care that any drinking vessels so used are kept absolutely clean. Above all, special care should be taken to provide *shade*, hot sun being most prejudicial to vigour and growth. Of course, living shade is far the best. Where there are no trees or shrubs, creepers on the fence will add to the utility as well as beauty of the chicken run, and are in foliage just when they are wanted; sunflowers also grow rapidly, and give a great deal of shade and root-scratching, as well as excellent food rather later on. While little, chickens do a vast deal of good and no harm amongst bush-fruit. Much can be done in these ways; lacking them, artificial shelter must be provided, or the growing chickens will suffer, in growth as well as plumage. The house and shed may have such an aspect as to suffice, in which case the birds will gladly resort there during the heat of the day. Failing that, coarse linen or sacking may be stretched on sticks like a tent; or four sticks can be driven into the ground to stand out about a foot, and on these the corners of a hurdle may be laid, to be covered by fern, or branches, or straw; the chickens will get under this when the weather is hot, and upon it when cool, and enjoy it generally. In a confined run, such a shelter platform practically increases the area available.

Chickens which appear Flagging.

In yards where numbers of chickens are reared, about or soon after the middle of the summer they often appear to flag, or almost to cease visible growth. One such stage almost always occurs, when the first plumage is about completed; but this is merely Nature's pause after the effort of feathering—life and vigour are not affected by it, and growth is soon resumed. What we here refer to is at a larger and later stage, and is not universal. The exceptions are such as grow up upon a farm, or other free range; these do not suffer in that way, but march on making frame, and grow up quite as large, though not while young so heavy in flesh, as those fed in limited runs, which are the subjects of the flagging here referred to. One cause of it is sheer *monotony*, which animals feel as much as we do, and is the reason why fowls will not walk and run about in a confined place as much as on a farm. They know every inch of ground; there is no change; and they get listless, walk over it less and less, become torpid and perhaps too fleshy; all which is very good for table, but not for health and vigour in stock birds. Besides that, the run has gradually been getting tainted; not perhaps offensively so, or even to a degree actually poisonous; still it affects the air close to the ground, where the fowls live, more than higher up where we breathe it; and though not perhaps poison, the difference is as great as between fresh country air and that of the crowded part of a great city. Disinfectants cannot help us much, except that in very hot and dry weather copious watering with sodium or potash permanganate occasionally, really will supply actual oxygen to both ground and air, which is what we want. The real remedy is *change* to fresh air, just as it is with ourselves.

Such a crisis generally comes in average moderate yards just about the time when it is imperative, if not done weeks before, to separate cockerels and pullets. It is partly on this account that the experienced breeder makes every possible effort to provide by that time *two fresh and sweet runs* for these—runs which have been vacant long enough to be sweet and pure. If these can be *grass* runs, with a few trees or shrubs, he knows how the birds, when once removed there, will appear to spurt ahead. It is not only the freshness; but the place is *new* to them, and they tramp all about it with renewed zest, which will last them till they have passed the most susceptible age. But even fresh and sweet bare runs will give an apparent fresh start, if attended to, numbers rigorously weeded down, and the birds not over-fed. It is still *a change;* it is fresher than where they came from; and the droppings of a few selected larger birds are easier swept up and removed than those from many small chickens. The breeder who knows things, makes the best in this way of his limited space, if it is limited, and takes care not to grapple with more stock than he can manage in some such manner.

We need not follow the rearing of ordinary stock any farther, and the special care of birds destined for exhibition will be more fully and appropriately dealt with in a later chapter. Chickens reared for other purposes will be either gradually drafted into the older stock, or in larger numbers be placed in larger or smaller flocks, with a house to sleep in at night, larger than a coop, but which need not be so large as an ordinary fowl-house. So long as growth is proceeding they should be still fed oftener and more liberally than adult poultry, but otherwise they will give no trouble, and need no further consideration in this chapter. If it is intended to fatten them for market, it is of considerable importance to rear them to a considerable extent upon the Sussex form of ground oats, which they will then receive; if they are not so reared, it is found that when the time for fattening arrives they do not improve to the same extent.

Artificial Brooding.

Chickens may have to be artificially reared even if hatched under a hen: but for the immense number now hatched in incubators, so greatly increased owing to the popularity of non-sitting breeds, artificial brooding is obviously indispensable. The growth of artificial rearing during recent years has been remarkable, and is shown by the number of appliances now exhibited at every large poultry show. The choice of method will be greatly governed by circumstances. The rearer of sitting breeds will need to keep his best hens sitting, and with chickens to some extent, or their vigour may suffer; and, on the whole, the natural method will generally best suit operations in a small way, if sitters are at command. With non-sitters it is different; and, moreover, the large breeder will prefer methods which enable him to carry out his plans at fixed times, independent of the caprice of his hens. He will also appreciate the fact that incubator-hatched and artificially-reared chicks have a great advantage over others, in starting free from vermin.

For sudden emergencies, at ordinary seasons, such as April and May, a quite cool or unheated brooder will often suffice, and can be quickly extemporised in several ways. We reared a brood of eight, whose mother had died, on one occasion, by tacking a piece of sheepskin mat, about 14 x 10 inches, all round the edges alone, to a piece of board, supported on a strip of board at the back and two pegs at the front corners. When placed in position the wool mat sagged down in the middle, and the chicks nestled against it, the pegs keeping the front higher than the back. One of the chickens, however, hanged itself in the wool, and it would be better to cut the skin into pieces an inch square, and sew them on a canvas at inch intervals, which would allow free passage. If such a coverlid were tacked to a skeleton frame instead of a board, a rubber hot-water cushion, well wrapped in flannel, could be laid on it at night when required; or the cold brooder, on a shallow tray of peat-moss, could be brought into the house in severe weather. At one time and another we have known many chicks reared with such simple appliances as these, but they are, of course, only sufficient for fairly late broods. There is far less need for them now, when a post-office order will bring a proper apparatus at any time by return of post, than in the days when we experimented with such matters.

Pioneer Brooders.

The first efficient heated brooder sold in England was brought out in 1873 by Mrs. Frank Cheshire, a successful exhibitor of light Brahmas, who reared all her own stock in this way and by preference, though with so many sitters at her command. Its construction will be sufficiently explained by Fig. 56. The top was a zinc tank A B, about an inch deep, closed except for a filling and vent aperture, and supported on a light frame, so as to be on a slant. The lower edge of the tank descended round a flue E, encased by the water, and heated at one end by a small lamp, and in the upper portion one or two partitions or baffles were soldered in such a way as to keep up a circulation in the heated water. Under this heated tank was slid a separate light frame of wood made to fit, roofed with canvas, to which were sewn the top ends of strips of flannel K, about 2½ inches long and three-quarters of an inch wide. These, warmed from the top, formed the brooder, set as usual upon dry earth. The chicks were kept for the first day or two in a small nursery, consisting of an open-topped box floored with earth or ashes, at one end of which was placed a much smaller hover or brooder made of flannel strips in the same way, and warmed by a rubber cushion-bottle of hot water. Here they learned to run in and out, before being transferred to the larger brooder.

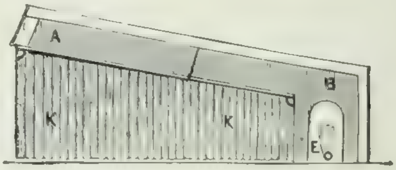

Fig. 56.—Mrs. Cheshire's Coverlet Brooder.

Several breeders used this apparatus, and we reared all our own chickens by it one season, with quite good results. But the second year, when most of the work had to be left to others, many died and the rest did not thrive; and others had very similar experience. Much of the failure was traced to want of sufficient and constant care in deodorising the apparatus: it required to be daily turned upside down, clean, dry earth well shaken into the flannel strips, and so left for some hours exposed to the air before the earth was shaken out again. We found also that the heat was too great; not, perhaps, as now reckoned and practised, but in the circumstances. With the aid of our many friends and correspondents we were able to make an exhaustive investigation; and it soon appeared that the best results were always accompanied by the lowest recorded temperatures, even though, in some cases, the chicks showed evident signs of being somewhat chilled; in spite of that they did the best, and lived when others died. We know now that the real reason was want of circulation and ventilation of the air; it was entangled amongst the flannel strips, and the foul, *re-breathed*, confined air simply sweated and murdered them, at a temperature which might not have been too great with purer atmosphere. We mention facts now only historical for the important lessons they convey.

For these reasons chiefly, brooders of the "coverlet" kind have now almost everywhere gone out of use. They were, however, and can be, made efficient. The later and more successful ones were constructed so that the nestling cover was lowest in the centre, rising all round, on all sides, like the convex body of the hen, and with tufts of sheepskin, or loosely spun thread lamp-wick, instead of flannel strips. A very efficient one, which was rather widely used for a time, consisted of such a nestling cover *swung* by cords from a hook above, which moved and swayed a little with the motions of the chicks, thus increasing the circulation of air. A coverlet thus made and slung, with a hot-water rubber bottle wrapped in plenty of flannel laid on top, as we can state from personal knowledge, makes a very efficient apparatus, from material always at hand except the rubber bottle, which can generally be got at any chemist's shop; such expedients may therefore save a valuable brood on occasion. Heat might be kept up longer and more uniformly by adopting the principle of the hydro-incubator before described, filling the rubber bottle only very slack with hot water, and bedding on top of this warm bottle fresh stone bottles—say a couple of common ginger-beer bottles—filled with *boiling* water, renewed at intervals, covering the whole with thick blankets. The heat from the hot bottles will gradually percolate downwards through the other.

All such brooders should, as scrupulously as others, be placed upon half an inch of dry earth or sifted ashes, renewed daily, or upon peat-moss litter. They can only be used out of doors when placed beneath a shed or other shelter; unless enclosed, like those presently described, in a much larger hutch or shelter, to screen them from the wind, and to provide a shelter for the chicks when they need this, but do not actually crave the heat of the apparatus itself. The coverlet portion must be regularly deodorised and disinfected in the way already described, and an occasional fumigation with sulphur or chlorine is very advisable, as the coverlet material, whatever it is, is specially likely to retain various microscopic disease-germs.

Types of Modern Brooders.

At the present day, and where artificial rearing is seriously intended, it is found much the best to rear the chicks in a chamber sufficiently heated, but with nothing touching their backs. Practice chiefly differs as regards the degree to which heat is specially radiated from the top, or more evenly diffused; in whether it is at all confined or not under a "hover," as distinguished from an actual coverlet; and in the method of heating. The varieties made can readily be classified into certain types, of which it will be most useful to give in mere diagram the general type-forms.

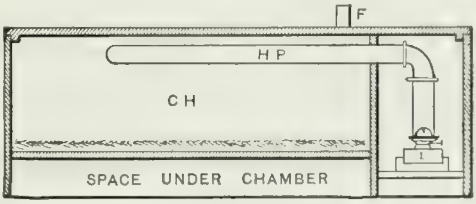

Fig. 57.—Circulatory System.

That indicated in Fig. 57 is more common in America than England. As here shown, the heat from the lamp L passes through a loop of hot pipes H P back to a flue at F, radiating heat to the chick-chamber C H from above, but from such a height that the chicks cannot touch. Sometimes this kind of brooder has been furnished with a thermostat and heat regulator, but this is not usual. In England, brooders of this class are more usually constructed with a water-tank at the roof of the chick-chamber, through which the flues pass and heat the tank: this has the appreciable advantage that if the lamp goes out, or blows out, the brooder will retain warmth for some hours. This makes a tank safer for some inexperienced poultry-keepers, but amongst experienced rearers such an occurrence ought not, of course, to happen. Or the flues may pass through a hot-air radiating chamber. The general type may be defined as that in which the heat of the lamp circulates through heated flues, and only radiates heat from above the chicks.

The type shown in Fig. 58 may be regarded as in some degree a simplified form of the foregoing, and in various modifications is rather common. Here the heat from the lamp L ascends direct through a sheet-iron drum or large flue D, into a flat, extended hot-air chamber above, from which it escapes through an upper flue not in line with the lower one, so that the heat may be more effectual before escape. The chick-chamber is thus heated partly from the drum D as a centre, but chiefly from the top; and round the drum D is usually fixed at a little distance a wire-gauze guard G, to keep the chicks from touching the hot sheet-iron.

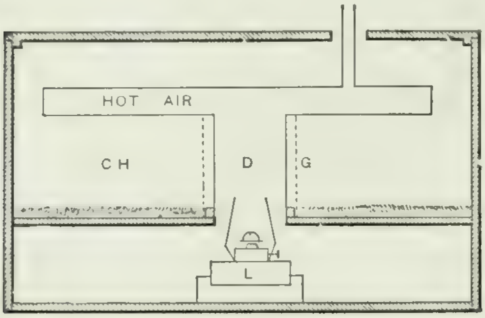

Fig. 58.—Hot Radiating Chamber.

Still further simplification is effected in what may be called the "radiator" type, which is perhaps most common of all. Here the heat passes up a flue D as before, usually smaller, but protected as before by a wire guard G, and straight up through the exit flue. But in metallic connection with the central flue is the radiator R, a circular disk of sheet-iron, extending over the top of the chick-chamber C H, and which is also continued through the flue itself as a *perforated* sheet at E, thus "choking" the flue there, and absorbing heat from the lamp. Thus the radiator becomes heated, and radiates warmth downwards as before (Fig. 59).

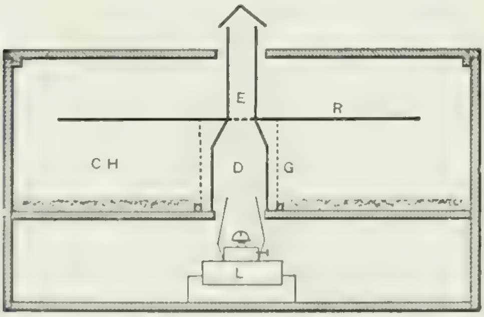

Fig. 59.—Flue and Radiator.

Finally, in some brooders, the central drum or flue D in the above is entirely done away with, and we have merely a lamp in the centre, protected by a wire guard G, as in Fig. 60. We give this diagram in a form that represents a well-known type of brooder, where the wire guard G is somewhat narrowed in at the top to direct the lamp fumes into the flue above, and on the top of it rests a sheet-iron disk or radiator R, perforated in the centre to allow the hot air to pass upwards, as in the preceding figure. Here the sides of the chick-chamber C H are circular and of porous material, which is the special feature of this brooder, but the other parts of this arrangement are very common. There is a difference of opinion about the advisability of the *light* from the lamp thus reaching the chick-chamber at all times. It is said, on the one hand, that the chicks can thus "see to feed." We do not think it desirable, but very much the other way, that chicks should be accustomed to feed at all within the *warmed* portion of the brooder; we rather want to get them out on every possible occasion, which is defeated if we at all accustom them to expect food there. Of more importance, probably, is the fact that Nature has very evidently arranged darkness for the period of sleep; and we therefore believe that light at an unnatural time must levy some tax upon the nervous energy of those subjected to it. On that account we think this type inferior to the preceding, to which it can be readily converted by any who possess it and who share our views: it is only needful to introduce a dark drum, such as a tin canister with the ends removed, inside the wire guard.

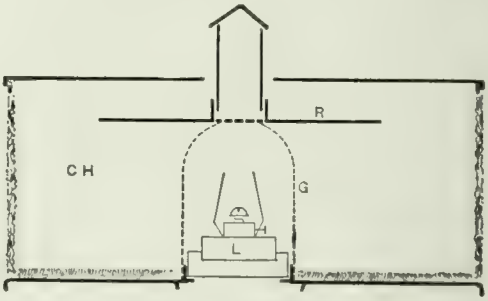

Fig. 60.—Central Lamp.

Another occasional modification of both these types requires a few words. In America, more often than in England, a short curtain of cloth, cut at the bottom into strips, is often attached to the circumference of the circular radiating plate, as shown later in Fig. 61. This prevents the heat from escaping so rapidly to the top of the chamber and outer air, and makes a warmer brooding place for the chicks.

Curtains to the Hovers.

Such a curtain, reaching to within an inch of the floor, has another use, in that chickens instinctively seek to "go under" something; and it also locates the brooding place for them. These are good points. On the other hand, such a curtain confines the air, and causes some of it to be re-breathed, than which nothing can be worse. The result of American experiences, according to which health was improved by ventilating the "hovers" of brooding houses, and recent developments in doing away with hovers and curtains altogether, appear conclusive to the effect that it is better either to dispense with curtains, or if retained for the sake of their instinctive help to the chicks, that they should be copiously ventilated by plenty of free apertures all round the top.

Only one other type requires notice, shown in Fig. 61. Here the heat impinges upon the metal roof C of a large lamp-chamber, which we have here shown with a small central flue F, the best form in our opinion, though by no means universal. This is at some little distance from a sheet-metal lining under the bottom of the chick-chamber, which has a large aperture in the centre from which rises a short drum, or flue, surrounded by a wire guard G, as in the former diagrams. The outer air enters through the spaces S S between the two sheets of metal, is thus warmed, and passes up the drum against a metal radiator, as shown by the arrows. The radiator is here shown with a curtain, as described above. In brooders of this construction the wooden floor above the metal lining becomes gently warmed for the feet of the chicks, and pure, warm air is poured gently down over their backs, while the lamp fumes pass out altogether. With various minor modifications, this general construction appears rather a favourite one in America for single out-door brooders, and is also used in England.

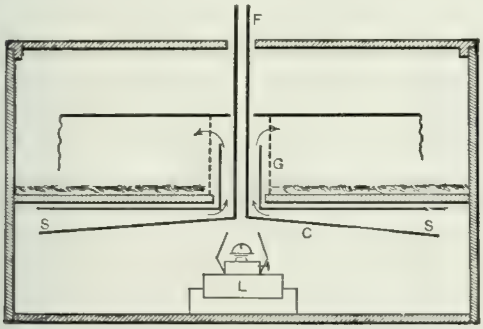

Fig. 61.—Ventilating Type.

General Plan of Brooders.

Whatever the type, the general arrangement is pretty common to all, and experience has shown it to be desirable. The brooding or warming portion itself is in all our diagrams supposed to be seen endways, and should, in reality, occupy one end only of a chamber about double the length. Thus, besides the more heated part, there is the other end farther from the heat, where the chickens can have a warm, but still cooler temperature. This part should have a window. They can then to a great extent suit themselves, and in brooders of modern construction usually do so. This much is sufficient for what are called in-door brooders, or more properly, such as are meant to be used under a shed, or other adequate shelter. Where this is not the case, another and outer apartment becomes necessary, roofed over at least, and all the better if the roof is glazed, but with one side, or front, open-netted. In this the chicks have a shelter from biting winds and rain, and need only run into the brooder when they really require warmth. In such an outer shed they should always be fed, when not fed in the open air itself; it constitutes, in fact, their scratching shed and shelter when they have no other, and should have all the constant care and cleanliness of such a shed, but in higher degree. There may be, besides, an outer run only wired over, but this will depend upon circumstances, such as cats or vermin. A brooder thus further furnished becomes what in England is called an "out-door rearer" complete, and many forms of such can be seen at the principal poultry exhibitions. The reader will be able readily to refer any of them to some one of the types above.

In arranging a brooder for work, people differ. The floors of most are necessarily raised, owing to the requirements of the lamp, and this also keeps them dry. Some prefer to have an inclined chick-ladder or gangway sloping from the entrance to the ground; others prefer to excavate a hollow, and place the brooder in it so that things are on the ground level. This has some advantage in shielding the lamp from winds; but on the whole the other is best, especially for changing ground every now and then, and it is easy to arrange a sheltering board if required. A complete "rearer" goes all together on the ground, of course, and in it the lamp is perfectly shielded, and storm-proof from all except flooding.

In regard to choice of a brooder or of a rearer, we will only give one special piece of advice, and that is to choose one which has a thoroughly reliable *lamp*, and adequate ventilation. A poor lamp means endless trouble and disaster. The Stemp wicks are now generally used in all brooders, and entirely obviate the need for trimming throughout the brooder-life of a lot of chicks. This little practical advance in lamps has saved at one stroke, as in incubators, a great deal of trouble and vexation.

Temperature in the Brooder.

As regards feeding and general management, brooder chicks will not require any marked difference in treatment, at least as a rule, or while all goes well. The first thing to attend to is the heat, and it has to be borne in mind that while a hen cannot be either too warm or too cold for her charges, the brooder may easily be either. The greatest care should especially be taken that there is *no chill* to the chicks in removing them from the incubator or nursery to the brooder, which must be heated up all ready for them. We have seen repeatedly, that even a slight chill just then may give no end of trouble in all sorts of ways, but is especially apt to cause diarrhœa, which when thus started early, weakens them terribly and may never be recovered from. More heat is desirable in any of the modern constructions with free air-space, than was possible under nestling material. The novice should at first use a spare thermometer, and by this the heat at first, in winter or spring, when the chickens are in, should be about 90°. But after about two days this should be reduced to 85°, and by a week later to about 80°. For later broods, if at all warm, less will do, but in cool weather they like warmth. After the first start their behaviour should be watched, and if they crowd up to the heat, all together, a little more will be advisable; if, on the other hand, they prefer to be at the entrance, or far off the heat, reduce it a little. The thing is, not to run up the heat to a sweating pitch when only a little more seems required, as is very easily done. When experience has been gained, the thermometer will not be needed, and the feeling by hand, and observation, will be sufficient guide. The chicks ought, in early broods, to be glad to go in at proper intervals, but soon come out again; and to lie about comfortably, without either panting, or over-much crowding together. Two or three very weakly chicks will sometimes start a *habit* of crowding, which then works much mischief: for this reason it is better to kill at once any weakly chick that shows any such disposition, for the sake of the others. The first day, the young chicks should be confined almost to the brooder proper, a little wire screen, or pieces of board, being arranged so as to give them a run of a few inches only from the entrance. Once or twice they may even need guiding a little through it. The second day a little more scope may be allowed. Generally, after that they will know their way, but brooders differ in the facility with which the entrances are found and entered at first.

Feeding and Management.

The chief chicken complaints will be the same as already mentioned, with the exception of insect vermin, from which the chicks ought to be quite free. The others are very apt to become emphasised when chicks are reared by this method, under any error in respect of temperature. A chill will almost always set up diarrhœa; and, on the other hand, too much heat will do the same, while it also increases the tendency to "cramp," the general causes and prevention of which have already been treated. It may also, and often does, cause pneumonia from subsequent exposure. Particular care should be taken that brooder-chicks are fed, during the warm stage of their career, somewhat on the side of a spare diet. They will be none the worse in the end, and we can state positively that this simple course will often save an infinite amount of trouble. A small pan of granulated charcoal is also a valuable preventive of bowel complaints; and with brooder-chicks, a little chicken-grit mixed in one feed a day is decidedly advisable.

Dry Feeding.

There is not only less tendency to diarrhœa, but a great many breeders find that they succeed better altogether with their chickens if the latter are brought up entirely upon *dry food* for the first three or four weeks, and even longer. Many poultry-farmers in America rear their chickens altogether in this way, and prefer it, but such a thorough system is no doubt better adapted for the lighter-built laying breeds than for the heavier class of fowls. The "dry feed" mixtures which are being more and more advertised and sold every day answer very well; but on a large scale it is cheaper to prepare the feed at home. The first day or two the chicks do very well on coarse oatmeal or cracked groats and millet, with a little granulated biscuit-meal; then a mixture of whole groats or hulled oats with millet and canary-seed and cracked dari may be used. Very soon cracked wheat and maize and dari can be given, and the more expensive seeds withdrawn; but a little sunflower is always valuable. American breeders often keep one hopper always full of cracked maize and wheat, and another of "beef scrap" or granulated dried meat of some kind, and they find the chickens grow well when fed in this way, with a minimum of trouble. It is found that they do not take more of the meat than they require.

The food should be given outside the hover on every occasion; and although at first, in severe weather, or for a day or two, feeding in the outer chamber or end of the chamber may be allowed, as soon as possible it should be always in the open air. To *get them out* is a main object to keep in view, and chicks that will not come out freely at feeding-time are in a bad way. However little food it may seem, if they do not appear hungry at feeding-time, feed less and less till they do. It is quite astonishing how little they need in the very early days, and it is in the first weeks that most mischief is done. Brooder chickens also especially require green food regularly and freely, unless there is plenty of clean grass run for them, and even then they should have the small-cut grass for a week, to get them into a habit of eating it.

The chickens as they grow should be systematically hardened off from the heat, till they can do without any, but the age for this will of course depend upon the season; in April they will often do very well in a coop without heat at four to five weeks, while early in the year it may take two months. The heat will be gradually brought down to 70°; then the lamp will only be lit at night; then later at night; then only once or twice a very small flame allowed for cold nights; and then they are independent, and the anxiety is over. In large establishments it is more convenient to have separate and larger "cool" brooders, but still warmed, to which the partly grown chicks can be transferred at the proper time. Such brooders are furnished with smaller lamps in proportion, by which the lower temperature is more easily controlled.

Number in One Brooder.

Our advice is very decisive to all ordinary breeders, not to place more than fifty chickens together in one brooder, but to rather multiply brooders than increase their size. As regards many people, twenty-five or thirty would be a sounder course. If anything goes wrong, it is very apt to affect the whole batch, and then obviously the loss is heavier. Again, the larger the lot the greater the likelihood, upon any provocation from one or two weakly chicks, of that *habit of crowding* already referred to, which, whenever it happens, is a great drawback to the brood. In choosing a brooder for a given number, again, spare space should be provided, so that there shall be enough when, say, three weeks old. It is, of course, possible to operate on a much larger scale, and descriptions of these big plants are familiar in connection with American poultry-farming. But even in America, where such operations are common, the ordinary breeders of stock, by a large majority, find the limit of about fifty suit their purposes best in the end.

One more caution may be needed. The young chicks especially should never be allowed upon any *smooth* hard floor, in brooder, or chamber, or run. We have seen a plate of zinc, with only such a sprinkle of earth or peat-moss upon it that the claws went through to the metal. The result is that the birds slip on such surfaces, and the efforts to recover, or to prevent slipping, at best strain the tender joints, and sometimes the two feet will even slide apart, and severe sprains may occur. Many cases of deformity, or lameness, or crooked toes are caused in this way. The peat or other litter should be deep enough, upon any hard surface, to make firm walking.

Cleansing after Use.

When a brood is through, the litter should be emptied out, all swept clean, and the whole opened and exposed to the sun and air, lest any hidden germs of tuberculosis may have found lodgment. Whenever there is any real cause for suspicion, it is best to give a thorough double fumigation, which is easily managed, if a large lidless box is provided that will cover the whole brooder, when inverted over it, with space to spare. When this has been arranged, burn out a "sulphur candle," leaving things to stew a good while in the fumes. Air well after this, and then give a doing with chlorine in the same way, placing chloride of lime in a saucer, pouring on sulphuric acid, and letting down the box to confine the fumes. We are here only supposing that there is definite reason to believe tuberculosis has prevailed in previous broods, in which case no pains are too great to prevent recurrence; but do not, of course, mean that any such measures are commonly necessary for chicken brooders. As a rule, reasonable cleaning and airing are all that can be required.

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CHAPTER VII.

POULTRY FOR THE TABLE.

EVERY breeder of poultry, even for exhibition, will have a considerable number of birds whose best destination is the table. The somewhat severe "weeding" upon which we lay stress in a subsequent chapter gives him plenty of such, and there is also a considerable surplus of cockerels. This last occurs also when pullets are bred merely for laying; so that, even though supply of eggs for market be the main object, the cockerels produced at the same time involve the marketing of a considerable quantity of table poultry, which must be embraced in the plan of operations. In the latter case, the number will probably be too large to be consumed at home, and must be made the best of for market. Lastly, there is the case where supply of table poultry of the best quality is the main object in view, and where both breeding, the feeding, and fattening are brought to bear upon that object with all the skill and knowledge available.

It may be well to consider first the case of the breeder of prize poultry, who merely wants to dispose of such surplus stock as is not up to the mark. If he is in a small way, the home table may very likely take all he has to spare at merely killing prices, and these may be of all ages. For reasons explained later on, such a breeder may hatch double or treble what he has space to rear, and kill a good portion very young indeed, at only a few weeks old, as soon as ever their worthlessness becomes apparent; or even the cockerels of a laying stock may be better cleared out, if possible (all but a few of the best), at a similarly tender age. Even such very young birds can be utilised in chicken puddings, made as follows: Take as many as necessary and let them miss their last feed, and fast the night; decapitate them in the morning, pick clean, and hang in a cool larder for twenty-four to thirty-six hours. Having taken out the crop and viscera, put the necks, and cleaned gizzards, and livers, and hearts in a little water to stew for gravy; then cut up the birds, taking the point of a knife from the point of the breastbone to the wing on each side, removing thus the half breast with each wing and leaving the carcase bare. Cut the breast-pieces apart from the wings, also take the thighs and drumsticks (separated) and the side-bones, if there is any appreciable meat on them; chop up the rest of the carcases and stew them also for gravy. Make a nice suet crust and line a basin, and in this pack carefully the pieces of chicken, with the addition of three or four slices of salt pork or ham, also cut in pieces, to which may be added at discretion, or not, a sheep's kidney or two cut up, or a few mushrooms and oysters. Pour in the gravy, close and tie up the pudding, and boil long and gently. People who once try this will often be asking themselves, whether their very young wasters are big enough yet for a chicken pudding.

Chicken Puddings.

When the number is more considerable, as with cockerels from a stock bred for layers only, if there be any market, such young birds can be treated and sold as the *petits poussins* described a little farther on, especially as layers like Leghorns often do better at this very tender age than larger and finer breeds. But the pudding is always available, and we can heartily recommend it to all whom it may concern.

Broilers.

The next available age is from eight to twelve weeks, at which it is not usual to kill in England, though more are killed in America at this stage than any other. Such are, in fact, the well-known American "broilers," simply split down the centre of the carcase and the halves broiled on a gridiron: in a frying-pan they are not so good. The "broiler" will be found a novel and most appetising dish for the home table, whether or not it may ever attain popularity in the British market, and will clear out quite a number of birds at a nice early age, leaving the ground free. Moreover, it may be well to remember that such home use of the young birds, through the tasting thereof by friends and visitors, may do something to gradually *create a market* for a class of chickens which in some respects is—as proved in America—most profitable of all, given only the demand for it.

By three or four months old, chickens of the

Naturally-fed Chickens.

larger breeds begin to be fit for roasting and boiling, and such breeds, if room allows, are most profitable that way. Fed as a fancier feeds his birds, they will be amply plump enough for the table, and need no special penning or fattening, nothing, in fact, beyond eighteen hours' fasting. We have killed many Brahma cockerels at four months old which weighed six pounds, and been told repeatedly that both in quality and quantity of flesh they excelled any that could be purchased in the ordinary way. Many English palates prefer chickens which, by high feeding from the shell, are thus well furnished with firm flesh, to fatted fowls; and from three to six months old the mistress of any establishment will gladly welcome as many birds for the table as the ordinary breeder of prize poultry is at all likely to supply. If any of them do appear somewhat poor, ten days or a fortnight in a sparred coop, in a place neither hot nor cold, and which can be darkened, during which time they are fed in troughs until "half-fat" in the way presently described, will suffice. Care should be taken to place two or three together in the coop, to see they are quite free from vermin, and to fast them for some hours before giving any food at all, in order to ensure good appetite from the start. All other details necessary will be found a few pages farther on, but we emphasise these as apt to be forgotten by the unprofessional amateurs whom we have here in view.

Aged Fowls.

There is one more thing to consider before we leave the case of people with small numbers of fowls. It is that of old fowls—too old to sell for any real price, or to cook in the ordinary way. Such birds may be cooked in various ways so as to be tender, though almost beyond mastication if treated in the ordinary way. Supposing the bird is to be boiled, the simple rule is to boil *slowly* for about as many hours as the bird is in years of age. If it is to be roasted there are two expedients. One is to gently simmer it for nearly as many hours as above, and only after that, roast as usual till browned, well basting: it will be quite tender. Or the fowl may be wrapped in large clean dry leaves such as vine leaves (cabbage leaves will not do) and buried in sweet clean earth for nearly twenty-four hours, when it will generally be found tender. Hanging in a wet cellar might probably make it as tender, but it might not keep: the sweet earth keeps away any harm. Or the fowl may be simmered a few hours, and then cut up and baked in a pie. Or finally, if the cook knows how to do it, it can be boned, and then stewed into deliciously tender dishes in all sorts of ways. Thus every bird, of any age, is worth fair value for the domestic table.

Fatted Poultry.

It is different when we come to consider the supply of the public market, or the production and sale of table poultry as a business. Here fatted chickens alone command the best prices, and by fatted fowls we mean crammed fowls. Pliny mentions the inhabitants of Delos as the first to prepare fowls artificially for the table, by which no doubt cramming is intended, and in his time there is no doubt that the luxurious Romans patronised crammed poultry extensively. The market supply of the best table poultry depends, therefore, upon two main factors, viz. the adoption of the best methods in feeding and fattening, and secondly, the breeding of the most suitable fowls, whether pure breeds or crosses, both in form, and aptitude for laying on flesh.

As to methods of feeding, these are several, and differ in different countries. The chief English poultry-feeders have gradually made eclectic selection of the best elements from all quarters, and the fowls shown at recent Smithfield Club exhibitions of table poultry, have been pronounced by good foreign and English judges equal to any in the world. For the following practical article, descriptive and explanatory of this branch of the subject, we are indebted to Mr. Edward Brown, F.L.S., honorary secretary of the National Poultry Organisation Society:—

Fattening an Ancient Practice.

"The system known as fattening is almost universal wherever poultry have been brought to a considerable state of perfection as food for man, although there yet remains considerable prejudice against it, probably due to the term rather than to the system itself, though possibly the methods adopted account for some of the antagonism with which it is regarded. Nor is the practice a modern one. In ancient times it was followed by the Egyptians in connection with geese, as evidenced by tablets found in the Pyramid of Sakkara, which was erected about 4,000 years ago. References are also made by ancient Roman writers, notably Columella, showing that feeding off domestic poultry before slaughter was extensively adopted in Italy nearly two thousand years ago. So far as our own country is concerned, it is impossible to say how long the fattening of poultry has been carried out, but we are justified in saying, from evidence which it would take too long to quote here, that it was understood to some extent at least as far back as the sixteenth century. Within what may be termed the modern period, however, it has been practised largely. In Arthur Young's 'General View of the Agriculture of the County of Sussex,' published in 1808, an account is given of the system then in vogue, from which it would appear that hand cramming only was employed, as there is no mention whatever of machines. A most interesting point is the fact that at the time named the fattening of fowls was not confined to Sussex, for in Mr. Mavor's 'General View of the Agriculture of Berkshire,' we find that Wokingham, as it is now called, was 'principally famous for fatted fowl, by which many persons of the town and neighbourhood gain a living. They are sold to the London dealers; and the sum of £150 has been returned in one market day by this traffic. Twenty dozen of these fowls were purchased for one gala at Windsor, at the rate of half-a-guinea a couple. At some seasons of the year 15s. is paid for a couple. They constitute the principal commerce of the place.' For reasons which have not yet been fully explained, the trade has died around Wokingham, but I have had the opportunity of conversing with people whose forefathers were largely concerned in it.

Fattening as a Local Industry.

"Till quite recently the fattening industry since that period has been confined chiefly to the counties of Sussex and Surrey, extending about thirty years ago into West Kent. It now embraces an area extending from Ashford in the east almost to Guildford in the west. For these reasons the best qualities of poultry go under the name of Surrey or Sussex fowls, and there can be no question that the finest specimens have hitherto emanated from the South-Eastern counties of England, where the industry is a very important as well as a profitable one. It is difficult to estimate the actual value of this branch of agriculture, but a few years ago I obtained figures from the Railway Companies as to the extent of the traffic from the two chief centres, and these figures were afterwards confirmed by the observations of Mr. R. H. Rew, who presented a report to the Royal Commission on Agriculture, in 1895, on the 'Poultry Rearing and Fattening Industry of the Heathfield District of Sussex.' From these figures it was shown that in twelve months there were despatched from Heathfield and Uckfield about 1,850 tons of dead chickens, of an estimated value of about £200,000. It is impossible to afford anything like a correct computation of the total returns in all the three counties named, but there is evidence to show that it has considerably increased of late years. As an instance, Mr. C. E. Brooke, Past-Master of the Poulters' Company of London, despatched in 1898 upwards of 30,000 birds from his establishments at Baynards, and other places could be mentioned where the growth has been considerable. For a long period of time it was asserted that there must be special conditions favourable to this industry in the South-Eastern counties, but it is needless to consider this point, as it has been proved abundantly that fowls can be fatted elsewhere with equal success. Within the last fifteen years the work of fattening has been extended into several other counties, and we may expect to see this continue to a greater extent in the future.

"When we look at other countries, we find that amongst those where attention has been given to what may be termed advanced poultry culture, the fattening system is extensively followed. One of the best examples is France, which has hitherto had the character of producing some of the finest fowls in the world, though it is a satisfaction to know that English fowls now rival many, if not all, of the specimens met with abroad. Of course, there also we meet with special industries, such as the production of the famous La Bresse fowls in the Ain and Saône-et-Loire districts, and the La Flêche, Le Mans, and other grades in Normandy, where the work is carried out to a remarkable degree of perfection, and where prices can be obtained that are practically unknown in this country. But throughout France the system is followed very extensively, and the highly fatted and wonderfully finished specimens to be met with upon the Paris and other markets, place these grades of French poultry in the very front rank. In Belgium the fattening industry is carried out to a considerable extent in the district around the city of Malines, at Merchtem, Londerzeel, and adjoining villages in the province of Flanders. These birds, up to the present, are not so well finished as either the French or English high-class poultry, but the principle is recognised. In Western Austria, in the Styrian district, there is a good deal of fattening carried out, and in some of the best Central European places of resort very fine birds are sold under the name of Styrian *poulardes*. Of late, fattening has been taken up to some extent in Russia, whence vast quantities of chickens—usually of a poor quality—are received into Western Europe. This will account for the undoubted improvement in some of the grades of Russian poultry during the last few years. During a similar period something has been done in the direction of fattening in

Canada, due to the efforts of Professor Robertson, late Dairy Commissioner for the Dominion, who paid several visits to this country, obtaining information which he disseminated very freely on his return. The quality of the birds at present is not equal to our English standard, but they have been vastly improved as a consequence of the adoption of the fattening system, and as that system comes to be better understood, Canadian fowls will be much finer than is the case at present. Until recently poultry fattening was practically unknown in the United States, but it has been greatly extended within the last few years.

Advantages of Fattening.

"In order to appreciate the object of fattening, it is well to consider larger stock, where practically the same system is carried out, though, of course, different methods are employed. We accept without demur that for animals, such as cattle, sheep, or pigs, to be fed off is an absolute necessity, if the flesh is to have the quality and quantity desirable. Farmers buy store stock, as they are called, feeding them off or fattening them before they are sent to the butcher. To kill a lean animal would be very wasteful ; the proportion of flesh to that of bone and offal would be small, whilst the quality of flesh would be distinctly inferior to that of a fed animal. The reason why fatted flesh is better than unfatted, is that globules of fat are distributed throughout the muscles, displacing to a considerable extent the moisture found therein. Not only, therefore, is the bulk increased, but also when the flesh is cooked the fat does not evaporate to the same extent as the water, but, melting, softens the tissue, making it more digestible and finer in flavour. It may be contended that Nature has no system of fattening, and yet that wild birds and animals killed for food are found to be in good condition for eating ; but this statement is only correct up to a certain point. At seasons of the year when food is abundant, birds and animals are much fatter and plumper, and it is generally at these seasons that they are killed for food. A 'close' time for—say—pheasants, is not only enacted in order to prevent the birds being killed off during the breeding season, but also because at such periods of the year they do not carry the same amount of flesh.

"A further point to bear in mind is that, economically, the fattening system adds to the profit of the producer. Some time ago Mr. C. E. Brooke carried out a series of experiments showing the gain in weight, and the results of these were published in my book on Poultry Fattening.* Twenty-four birds in all were put up for fattening, nine cockerels and fifteen pullets. They were subjected to the system for twenty-eight days, which is longer than is usually considered to be necessary, but the prolongation was for a special purpose. The total increase of weight during the process was 55 lbs. 3½ ozs., or a gain of about 2 lbs. 6 ozs. each, the greatest amount of gain in any individual case being 2 lbs. 15½ ozs. I have known cases where upwards of 3 lbs. has been added to the weight of a fowl in a little over three weeks, but probably under ordinary conditions the average gain would be from 1½ lbs. to 2 lbs. Of course, a certain amount of this would be surplus fat, laid upon the intestines and around various organs of the body ; as in the case of larger animals, this must always be so. Still at the same time the edible portions of the birds were enormously increased. The estimated cost of fattening for three weeks is accepted as about 5d. per bird, whilst in establishments where men have to be employed another 3d. would be added for labour. Thus, apart altogether from the question of improvement of quality, the increase in weight much more than repays the expenditure. There is, however, a danger of excessive fattening, and birds carrying a large amount of surplus fat can only be in very limited demand. We should not like what is called Christmas beef all the year round, nor should we care to have specimens such as some exhibited at the Smithfield Table Poultry Show daily upon our tables. Both large and small animals are often fatted for such a season to the utmost, with a view of showing what can be done in this direction, and also of prize-winning.

"Another result of fattening is to improve the appearance of the bird. The flesh is not only softer and more abundant, but it is greatly improved in colour. The use of milk and of ground oats, as afterwards explained, has the effect of whitening the flesh ; and even with those birds which have yellow skin, it is remarkable how great a difference is found between fatted and unfatted specimens.

"With regard to the prices obtained for fattened poultry, these vary considerably. There can be no question that at certain seasons of the year birds can be sold in the London markets wholesale at 12s. to 14s. per couple; but these are the exception and not the rule, the picked specimens, not the general run, and the demand for them must, of course, be limited. But during the spring months good birds will always bring

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* "Poultry Fattening," by Edward Brown, F.L.S. London : Edward Arnold.

4s. 6d. to 5s. 6d. each, except there happens to be some unfavourable set of conditions or a glut in the market. Prices depend upon so many things that it is impossible to name any which may be taken as reliable in anticipation. The following prices can, however, be taken as averages in the Leadenhall or Smithfield Markets, London, for single birds :—

Prices of Fatted Fowls.

January	3s. od.	to	5s. od.
February	3s. od.	„	5s. od.
March	4s. od.	„	5s. 6d.
April	5s. od.	„	6s. od.
May	5s. od.	„	6s. 6d.
June	4s. od.	„	6s. od.
July	4s. od.	„	5s. 6d.
August	2s. 6d.	„	4s. od
September	3s. od.	„	3s. 9d.
October	3s. od.	„	3s. 6d.
November	3s. od.	„	3s. 6d.
December	3s. od.	„	4s. 9d.

These prices, however good they are, are far inferior to those obtained in France. At Paris 20s. to 30s. is frequently paid for picked specimens in the Halles Centrales, whilst even in the districts where birds are actually produced, prices range high. I have been asked by a woman standing in the market place at Bourg 20 francs for a La Bresse fowl which would not weigh more than 5½ lbs., and at Le Mans in Normandy some of the fatters can obtain at certain seasons as much as 25 francs for first-class specimens. Such prices are not obtainable in this country. The explanation is that French systems of cookery are so essentially different from our own, that while a fowl in England would perhaps serve half-a-dozen people, in France, by the accessories provided with it and also the fact that the number of courses in an ordinary French dinner is much greater than in an English dinner, the same bird would probably serve a score of people. Hence the cost of the fowl eaten for each person would relatively be no greater in one country than in the other. Personally I have no hopes that we shall ever be able to secure such prices, and it does not seem at all necessary that we should do so to ensure satisfactory returns. We have, however, in this country a larger population dependent upon others for their food supplies, and we must look rather to the increased number of birds sold to these, than to an enhanced price for each. At the same time, however, there is much to be done in educating the consumer, and within the last few years a distinct advance has been made in this direction. In many of the great centres of population, at one time, fowls priced more than 2s. 6d. each could hardly be sold; but purchasers are beginning to realise that a well-fatted specimen, for which they have to pay 4s. 6d. or 5s., may be cheaper than one at half the price. It is not the size of the fowl only, but also the relative proportion of flesh and of carcase which ought to give it the value. There are certain of our large towns where a fatted fowl was probably unknown until a few years ago, and now we see them regularly in the poulterers' shops.

Fattening a Separate Industry.

"We have now to consider the methods adopted in the production of fatted poultry both at home and abroad. In England and Belgium, fattening is carried out almost entirely at special establishments, to which the birds are brought in a lean condition to be fed off. In France this is the case to a more limited extent, the majority of the fatted fowls there being finished by those who rear them, the farmers' wives and daughters in that country being marvellously skilful in this work. There are, of course, many central establishments, and in not a few cases I have found that the owners only perform a part of the operation, buying the birds from the rearers in what may be termed half-fatted condition. Where the system is carried out as in England and Belgium, the fatters very seldom attempt anything in the way of hatching and rearing, leaving this work entirely to farmers and cottagers in the district, from whom they buy lean birds. Whilst it is desirable that more of our farmers should endeavour themselves to improve the quality of their poultry, it must be conceded that up to the present there have been manifest advantages from this system. The fatteners are very skilful, and in some cases families have been famous for their work in this direction for several generations. A fatter is able to handle a very large number of birds, and his ability and experience enable him frequently to get better results than would be probable by those who only have a few birds to sell. The cost also of labour in this way is considerably reduced. There are also benefits from larger operations in marketing, as buyers receive specimens in greater quantities, and the fatteners can meet market demands in a way that would be impossible to smaller producers. At the same time, it is a fact that some of the small fatters obtain the best prices, because they give attention to individual birds in a way that is impossible when large numbers are in hand.

"Those also who raise the birds have not suffered in any way from this system—in fact, it has been all in the other direction. Complaints are made by fatters, both in England and in Belgium, that so short is the supply during certain months, and so great the competition for suitable birds, that they have to pay prices which leave a very small margin of profit. Some time ago, a farmer living in West Kent gave me figures with regard to what he had done during twelve months in the sale of chickens to higglers who collect for the fattening establishments. Commencing the year with a stock of fifty breeding hens, he sold in twelve months, as the produce from these birds, £87 worth of chickens—that is, each hen gave him a return through her chickens equal to about 35s. Of course, he had to provide the food for these, but those familiar with the cost of stock-raising will know that the margin of profit in such a case is very much greater than is usual. Hitherto a large part of the deficiency in supply has been made up by Irish lean birds, but the indications are that these may fall off now that fattening has been commenced in that country ; and it is certainly true that of late there has been a decided advance in the price of Irish lean poultry. The chief difficulty experienced by those who have commenced fattening in other parts of the country than the South-Eastern district of England, has been in securing a supply of suitable specimens, but the deficiency will in time be overcome, as farmers and cottagers find it is profitable to rear such birds.

Collection of the Chickens.

"Most of the fattening establishments in Sussex send out or have connections with collectors, who go by the name of 'higglers.' These men scour the country round, buying up chickens as soon as they are ready, and it is not too much to say that the success of many of the fattening establishments depends largely upon this part of the work. One old fattener, who has made a very comfortable competency out of the business, told me that he always did the buying himself, as he felt that it was too important to leave to anyone else. Many of these higglers know exactly what birds are likely to be ready, and those who raise the chickens have no difficulty whatever in selling their birds ; in fact, frequently there are as many higglers call as there are birds to sell. The higglers generally have regular rounds on certain days of the week, and the custom is for them to pack the birds in large crates, carrying them away as soon as possible to the fattening establishments. Sometimes they will travel as far as twenty miles away from their centre, if there is any shortage of supplies.

"In Belgium and France a somewhat different system is adopted, and one which might with advantage be followed here. On one side of the city of Malines, in Belgium, there is a great district where large numbers of fowls are reared and it is on the other side that the fattening section of the country is met with. Markets have been established at various centres, where producers and buyers meet upon fixed days. The former take their fowls as they are ready, and there dispose of them to the best advantage. In many of the great districts of France such markets are found, and it would be a manifest advantage if the system could be followed in this country, especially in places more remote from the fattening centres.

"The prices obtained in England for lean birds vary considerably according to the time of year, and, of course, with the quality of the fowls ; but of late years there has been a distinct tendency towards increase in prices. The time of year when prices are highest is in April, May, and June. The prices range from 1s. 8d. to 3s. 6d., according to the season and the supply. Both of these extremes would be exceptional, however ; only very poor specimens would be sold at the former price, and the season would be a very bad one, with great scarcity of supply, when the latter price was generally obtained. It may, however, be accepted that the majority of chickens suitable for making the best class of fowls, and which range from eight to ten or twelve weeks old, would realise from 2s. 6d. to 3s. each, and at such rates it is evident that the raisers have a considerable margin of profit. In fact, many persons add greatly to their incomes by this work. Reference has already been made to Irish supplies. At one time birds could be obtained from Ireland costing about 2s. to 2s. 6d. each, but now 3d. and 4d. per bird more than that is the usual expense, inclusive of carriage. At the same time, however, it must be acknowledged that there has been of late perceptible improvement in the quality of the fowls brought from the Green Isle.

"Birds which are put up for fattening in lean condition give the best results, and the fatteners prefer specimens which are thin. It is undoubtedly the case that such specimens as are already partially fatted, do not give the same returns as those just described. Of course, it is with poultry as with every other kind of stock ; all the birds do not fatten alike, and there is a considerable difference in this respect. Some, for reasons which cannot be clearly understood, fail to put on flesh to the same extent as do others. This sometimes is a question of temperament, but there are frequently causes for which no satisfactory reason can be afforded. The skilful fatter, however, very quickly determines which birds are thriving least satisfactorily, and frequently by giving a greater amount of attention to these, he is able to overcome their backward condition. When we see in the markets specimens, all equal in quality and very nearly alike in size, this is generally due to the fact that they have been selected from a large number. We must not expect in connection with poultry any different results from what we find in all other branches of stock.

Half-fatted Fowls.

"A large number of birds are killed in what is called half-fat condition. These have simply been put up for feeding, either in open air or enclosed cages, without being crammed at all, and the result is to considerably improve the quality of the flesh, and to some extent add to its quantity, though, of course, they are not equal to the fully-fatted birds. Some breeders who have never gone in for what is known as the system of cramming, have obtained a measure of results by putting the birds into small runs and feeding them upon foods likely to produce flesh. We cannot, however, expect that if the birds are permitted to run about they will ever increase in weight to the same extent as when they are kept in strict confinement. The reason for this is that the latter birds are at rest and, consequently, do not eliminate from the body by exercise those materials which would otherwise be utilised in this way. In many parts of the country half-fatted birds would be more profitable to produce at first, by reason of the fact that consumers have not been educated to pay sufficient prices for the fully-fed specimens. They might be tempted to pay a little more for the half-fatted specimens, and thus gradually be led on to the more expensive birds.

Sussex Fattening Establishments.

"In the South-Eastern districts of England, when the birds are brought to the fattening establishments, at any rate during the milder months of the year, they are usually first placed in cages out of doors; and in the highways and byeways of Sussex, Surrey, and West Kent large numbers of these cages can be seen as we drive along the roads, or even from the railway carriage windows. As a rule such cages are placed in sheltered positions where they are protected from wind and, as far as possible, from rain, though this latter cannot always be accomplished. These cages are about 7 feet 6 inches in length and 20 to 24 inches from front to back, the front, ends, back, and bottom consisting of bars of wood, wide enough apart to allow the birds to get their heads through in front, but nothing more. The tops are usually covered with thin match-boarding, but in some places, in place of this, corrugated iron is employed, with furze bushes laid along the top. The cages are raised about 3 feet from the ground, and the droppings fall through the bottom bars. Many of the poultry fatteners make their own cages during the slack season, and various forms are employed, but the cage described above is generally admitted to be the best. How far this system of using outdoor cages is suitable, is open to question, because during the cold months of the year the birds must take longer to fatten by reason of the exposure, whilst in the hot months of the year it is found in practical experience that the birds do not fatten so well either in-doors or out of doors, owing to the excessive heat. During the warmer months a cool orchard or copse is most suitable for birds fattening, as it is cooler than where more open, or in sheds exposed to the sun. Of course, where outdoor cages can be employed, a much greater number of birds can be handled upon a given capital than if they are accommodated entirely in sheds. There are some parts of the country, especially those districts which are more exposed, where the out-door system would not answer at all; and wherever employed the birds should be well sheltered. Some of the best fatteners place these out-door cages in the orchards which abound in South-Eastern England, and such conditions, except in very wet weather, are specially favourable. Many parts of the country could not provide protection of this kind.

"The customary plan is to keep the birds in these out-door cages for a week or ten days, and during this time they are fed twice a day from troughs. These troughs hang in front, usually upon cords, so that they can be easily removed. They are cut out of a solid piece of wood, and a 7 feet 6 inches cage, such as we have described, with the trough, can be purchased for 6s. 6d. Those birds which are to be killed as half-fatted specimens are finished off entirely in these cages. Where, however, it is intended to fatten them fully they are then removed to the sheds, in which are placed similar cages; and by reason of the fact that the birds are kept much warmer and absolutely protected from bad weather, they fatten remarkably well under these conditions.

"It is needless to describe at very great length the various forms of sheds, as all kinds of places are used for this purpose. Wherever permanent buildings are available, provided that they are well ventilated, their use saves a considerable expenditure of capital. Mr. C. E. Brooke, of Baynards, had a large barn which was turned into a fattening shed, and as this is thatched it is wonderfully cool in summer and equally warm in winter. There are other fatteners who utilise similar buildings. The large majority of fatteners, however, have special erections for this purpose, some good, some by no means satisfactory. I have been in sheds which were made of corrugated iron, in which the birds were half roasted during the hot summer weather, and equally cold in winter. Conditions like these must militate greatly against the success of the process. In France such fattening establishments as I have had the opportunity of visiting have been accommodated in permanent buildings, and the same is equally true in Belgium. In these permanent buildings, which if properly ventilated are usually cooler than wooden erections, as a rule the cages are only placed one tier high, for the reason that this greatly reduces the labour of keeping the place clean. In one or two French fattening sheds I have visited, the cages were two or three tiers high; but this is certainly not a usual plan. As to this, something is said in the next paragraph. I have also seen in France, especially upon farms, the fattening cages placed in rooms adjoining the dwelling-house, but this is a method which, of course, we do not advocate in this country. The main idea is that the birds shall be kept warm, and to some extent in the dark, for, as Professor Warrington says in his 'Chemistry of the Farm,' 'Economy of food is promoted by diminishing the demand for heat and work. An animal at rest in a stall will increase in weight far more than an animal taking active exercise on the same diet. In the same way the increase from a given weight of food will be less in winter than in spring or autumn, a far larger proportion of the food being consumed for the production of heat when the animal is living in a cold atmosphere. Hence the economy of feeding animals under cover during winter. If, however, the temperature becomes so high as to considerably increase the perspiration, waste of food again takes place, heat being consumed in the evaporation of water. The temperature most favourable for animal increase is apparently about 60° Fahr. Quietness, and freedom from excitement, are essential to rapid fattening; the absence of strong light is therefore desirable.' It will be seen from the above observations that there is no restriction upon the form of shed so long as it is suitable for the purpose.

Fattening Cages.

"The form of the cages employed during this stage differs considerably. Those generally used in this country have been already referred to. They are usually 7 ft. 6 in. in length, by 20 in. high and wide, and are divided into three compartments, each of which has a sliding door. The cage is intended to accommodate fifteen or eighteen birds, one-third in each compartment. They are built entirely of wooden rods, excepting the framework into which these fit. The rods are about 1½ in. apart, except in the front, where they are a little wider, so that the birds can get their heads between for feeding. The bottom bars, upon which the birds stand, are usually of specially cut wood, an inch wide at the top and an inch in depth, narrowing to half an inch below, so that the droppings fall through without catching on the sides of the wood, as would be the case if they were perfectly square. The bottom bars run from end to end of the cage, or from side to side of the compartment, not from front to back. In France this form of cage is sometimes employed, but very seldom. Those generally used there are much more substantial, in some cases having solid sides, back and top, and in the front, except that a long narrow slit, wide enough to permit of the bird's head passing through, is cut in the wood. As a rule, in France, each bird is provided with a separate compartment; but, for a reason given in the next paragraph, such an arrangement is undesirable. This form was employed at first by Mr. C. E. Brooke, at Baynards, but in his further extensions he has adopted the more general and less expensive form of cage. Where single cages are used, fitted below is a sliding drawer or tray to catch the droppings. The one advantage of single cages is that they can be used two or three tiers high, though whether this is desirable deserves further consideration. In Belgium the cages are more nearly like those used in England than in France, though such as we have seen have generally been a little more substantial than the Sussex cages. In work of this kind there can be no question that simplicity is desirable, and for that reason it may be fairly claimed that the English form is to be preferred, saving both initial cost and labour in keeping clean. The difference between the more substantial cages used in France and those in England would be as a question of capital considerable, but under certain sets of conditions, such as extreme cold, the birds would be kept warmer and more sheltered where the solid-sided cages are employed.

"It may be well here to consider whether the system of keeping one bird in each compartment, or having several together, is to be recommended. My own opinion is that the truth lies about midway. Where birds are kept in single compartments they can be observed more closely as individual specimens, but at the same time there is greater danger of their pining than when several are together. This has been the experience of many amateurs, who thought it was only necessary to obtain a fattening cage, put some birds in, and have Surrey fowls; but frequently they find that instead of weight having been gained, it has really been lost. The skilful fatter understands his work so completely that he is able to overcome this difficulty, and by cramming compels the bird to digest as much food as he thinks necessary. Where several birds are together there is undoubtedly a strong competition in eating, and this fact must be taken into account. We find the same influence with larger stock. Given a proper supply of suitable food, two or three animals together will feed off better than if each were isolated. But when, say, half-a-dozen fowls are confined in one cage, there is greater danger of fighting and of feather picking, the latter one of the chief troubles fatters have to contend against. This would be minimised if only two or three birds were kept in each compartment.

"As already stated, in England and Belgium the inside cages are only placed one tier high, which permits of a good circulation of air, and at the same time greatly minimises the work of cleaning. In some cases the ground below the cage is covered with either loose earth or sand, and the droppings are taken away daily. In other cases there is a drop-board about two feet wide, sloping down to the front, below the cages, covered with a thin sprinkling of lime or earth, and thus easily cleaned. The accumulation of manure, especially such as is produced under these artificial conditions, would very speedily cause disease amongst the birds, and all good fatteners realise the importance of absolute cleanliness. In fact, in many of the best-conducted poultry fattening establishments it is a surprise to see how beautifully everything is kept. The sheds themselves are regularly lime-washed, and the cages treated in the same way as soon as one lot of birds is removed, before another is placed therein. The work of thus lime-washing the cages is greatly facilitated if a long trough, about a foot in depth, and wide enough to permit of the cage being dipped in, is kept full of lime-wash.

"Before dealing with the actual methods followed in the cramming of poultry, it may be well to inquire whether the system is a cruel one, because many charges have been made against it on this ground. With ordinary care there is not the slightest cruelty involved. A careless or inexpert operator, especially one who seems to think that the work must be done in a hurry, might hurt or injure the birds, and if this results, in consequence of the highly artificial state of the body, inflammation takes place and the bird speedily dies. This fact, in itself, is the greatest preventive of cruelty that can be desired, because the loss would be a very serious one. It must be borne in mind that the gullet of all animals, and especially of birds, is very flexible, and that in the case of birds mastication does not take place in the mouth, but whatever is swallowed passes down the throat the same in size as when entering the mouth. The chief danger in cramming, when either funnel or tube is employed, is that as the neck naturally is bent, unless it be straightened out, the pressure of the end of the funnel or tube would injure it if forced down. Another danger is lest injury to the tongue should take place when passing the funnel or tube into the throat. But a little care prevents any difficulty, and it may be taken, that so far as pain is concerned, there is no cruelty whatever in the cramming system. Whether the compelling of any animal to eat more than it might otherwise be disposed to take comes under the term cruelty, we need not discuss.

Systems of Cramming.

"The systems of cramming usually followed vary considerably, and may be divided into four sections. We do not call trough-feeding cramming, because there is no force or compulsion whatever when that method is employed. It is generally conceded that trough-feeding alone does not give the same results in weight gained, as when the birds are finished by actual cramming; but in some cases I have met with it was claimed that equally good results could be obtained without any cramming at all. In Belgium, for instance, very few birds are crammed; they are fed from the troughs during the whole period of three weeks; fatters, however, find it desirable to finish individual birds by a little hand cramming. It must be acknowledged, also, that Belgium table poultry have not the same finish as our best English or the finest French specimens, and this may be put down to the fact that they are not crammed. Recently I was informed by a gentleman, to whom I had given advice as to the preparation of fowls for the table of a well-known noble family, that they had never crammed the birds, and yet in some cases the weight had increased by as much as 2¾ lbs., entirely as the result of trough-feeding.

"There are two methods of hand cramming. In one of these the food is made into a stiff paste, and then formed into pellets or finger pieces, varying in size with the birds for which they are intended. As a rule, these pellets are a little

Hand Cramming.

more than an inch in length and about three-eighths of an inch in thickness. The operator has a supply of these pellets before him, with a bowl of milk; he sits upon a stool, and, taking a bird from the cage, holds the tips of a wing and a leg in each hand, and then places the body between the knees. If this is properly done the fowl cannot struggle in the least, as wings and legs are firmly held. He next grasps the head of the bird with the left hand, places a finger between the upper and lower mandibles, holding the tongue down, then taking one of the pellets he dips it into the milk, puts it into the mouth, pressing it down the throat as far as he can with the fore-finger; next, closing the fingers of his left hand outside the throat, he places a finger and thumb of the right hand above the pellet, which can be easily felt in the gullet, and running these down the throat carries it into the crop. To do this effectively the neck must be straightened to its full length, and when that is the case the pellet passes down quite easily. In order to fill the crop, frequently ten or twelve of these pellets must be given, and hence it is a somewhat slow process, as, of course, the most skilful fatter cannot handle more than forty to fifty birds in an hour, even if he has someone to lift them from and to the cages. Some of the finest specimens that are placed both upon the London and Paris markets are thus hand crammed, and it is acknowledged that each individual bird can be dealt with to a greater nicety than is possible by quicker methods. The system involves, however, a considerable amount of labour, and it is questionable whether it would pay any fatter to engage enough men to fatten a very large number of birds in this way. It is, however, being adopted in Russia, but in that country labour is very cheap.

"Another system of hand cramming is that followed in several districts of France, notably the La Bresse country. Here the birds are kept in very dark cages. The fatter first sits down in the way described already. Instead of forming the paste into boluses or pellets, he has a mass of the food before him. Opening the mouth of the bird with the left hand, he takes a piece off the mass of paste, dips it into milk, and places it into the mouth of the bird, and then allows the bird to swallow it. This system is even slower than where pellets are employed, and I have found it is adopted chiefly by those who have only a limited number of birds to fatten, generally women.

Funnelling.

"In Normandy the system of fattening by means of a funnel is very much in vogue. For this purpose the funnels employed are specially made. The bowl of the funnel is about 5 in. in diameter, narrowing to about ½ in. The spout is 6 in. in length and ½ in. in diameter. The spout, as seen by the illustration (Fig. 62), is cut at the end so as to leave a slanting outlet. The spout must be well finished and carefully soldered so that no sharp edges remain, and must be perfectly smooth to prevent cutting of the gullet, all sharp edges being soldered over. There can be no question that the funnel system of fattening is the most difficult to learn, but when learnt it is quite easy. Some time ago I suggested to one of the makers of these funnels that the spout of the funnel should be much shorter, and that a piece of indiarubber tubing should be fitted thereon, as this is softer and less liable to injure the throat. This was found to be an improvement in the hands of those who are not very expert. To introduce the funnel the bird should be held in the same way as described for hand cramming, and the neck elongated to its fullest length; then the spout is inserted through the mouth, and passes down the gullet into the crop. For funnel fattening the food must be in liquid form, like moderately thin cream, so that it will run freely, and it must be mixed perfectly smooth. In operation, after the funnel is inserted into the throat of the bird, by means of a large spoon or ladle the prepared food is poured into it until the crop is quite full. An experienced operator can cram eighty to a hundred birds in an hour by this system, and therefore it is, as a question of labour, more economical than hand fattening.

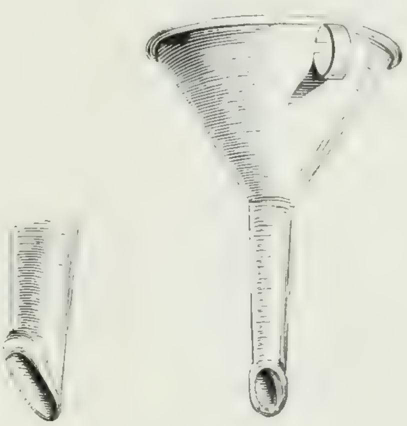

Fig. 62.—Funnel.

"The third system is by means of a machine, the two chief makes now employed in England being Hearson's and Neve's. These machines differ in a few details, but the principle is practi-

Cramming Machines.

cally the same. A hundred years ago, so far as we can learn, machine cramming was practically unknown in the South-Eastern counties of England. Arthur Young, in his 'General View of the Agriculture of Sussex,' published in 1808, mentions only cramming by hand. Later on, as explained in the early editions of 'The Book of Poultry,' an apparatus was introduced for the expediting of this work. So far as I can learn, such a machine was introduced in the 'sixties. This old type of Sussex crammer (Fig. 63) was a very cumbersome affair, resembling a large sausage machine, and was heavy to work. The food was placed in a reservoir, and forced out through a tube at one end. It required one man to turn the crank handle, whilst another actually crammed the bird. With both the Hearson and the Neve one man only is required. The Hearson crammer consists of a food reservoir, into which a supply sufficient for 100 to 150 birds can be placed. Below is a pump cylinder in which operates a piston rod, worked by a foot lever. When this lever is depressed the food already in the cylinder is forced through the nozzle at one side, and as the machine is fitted with a powerful spring, when the pressure is withdrawn the piston rod is drawn upwards again, allowing enough food to pass into the cylinder from the reservoir for the next manipulation. Upon the nozzle is fitted indiarubber tubing, which is made in various sizes to suit different grades of birds. Some of the fatters in Sussex use tubes made of bed ticking, because they are cheaper, and if carefully made they answer the purpose, although the seam down one side is rather liable to become hard and to graze the throat of the bird. In the Neve crammer the force pump is horizontal.

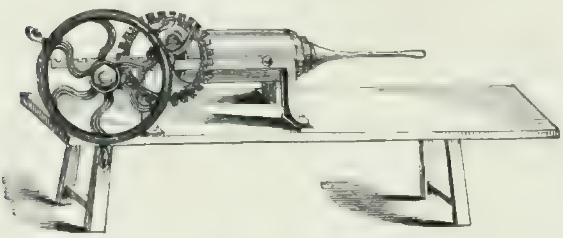

Fig. 63.—Old Sussex Cramming Machine.

"To operate with these machines the bird is held first by the legs and wings as already described for hand cramming, then placed under the left or right arm, as the case may be, and held firmly between the arm and the body so that the bird cannot struggle. The operator has thus both hands at liberty. Taking the head in the hand connected with the arm holding the bird, the comb lying in the palm, the mouth is opened by one finger, passing between the upper and lower mandibles, and the tongue held down. The other hand is now free to insert the tube into the mouth. As soon as it has passed into the throat, the head is changed from one hand to the other, and the neck being elongated, the head is drawn on to the tube, really pulling the body after it, and in this way the end passes down into the crop speedily and easily. The slightest pressure of the foot pedal forces food into the crop. The relieved hand, before this is done, is passed to the crop until the end of the tube is felt, and thus the operator can tell how much food is being forced therein, stopping the moment that enough has been given. So soon as this takes place the foot is slipped off the pedal, which stops the supply, the bird being then drawn from the tube. The operation can be carried out very rapidly indeed, and a skilful fatter can cram by either of the machines named 200 to 300 birds in an hour. For this system the food is prepared about the consistency of thick cream, so that it will just flow and no more. The great points in cramming

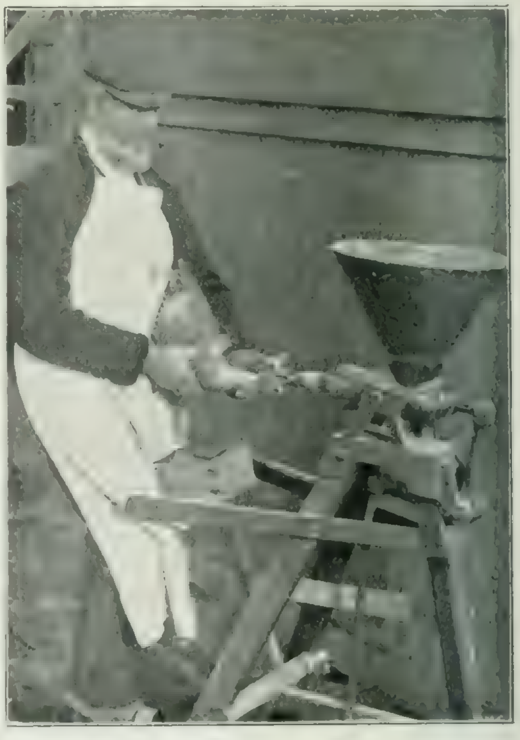

Fig. 64.—Crammer at Work.

by machine are to see that the tongue is held down, otherwise it might be torn by the insertion of the tube; that the neck is straight, or the pressure of the tube against one of the rings of the vertebral column would break it; and that too much food is not given. Under such a system it is, of course, impossible to treat each bird with the same nicety as is the case with hand cramming.

French Machines.

"In France machine cramming has not been carried out to the same extent as in this country, but there is much more done of it than was formerly the case. Some of the French machines, however, differ distinctly from those described above, in that liquid food is chiefly employed. One of these, made by Monsieur J. Phillippe of Houdan, has a long tube attached to it, at the end of which is a spring tap with a long brass spout. The food is about the consistency of very thin cream, and flows quite easily. The fowls are not removed from the cages, but in turn the operator takes hold of each bird, inserts the tube into the throat pretty much in the same way as already mentioned, and by pressing the spring allows the food to flow into the crop. Strange though it may seem, this system is no more speedy than by the Hearson or Neve crammers. Another form is that made by Monsieur Voitellier. He has a rod running the entire length of and above the cages, and upon this rod is hung a vessel containing several quarts of liquid food. The vessel is hung upon the rod by means of a wheel, so that it moves about freely. In the bottom of the food reservoir is a nozzle and indiarubber tube, at the end of which latter there is fitted a spring nozzle or tap similar to that just named. By means of this the operator can move about freely from one cage to another. Other forms of machines have been adopted in France, but these are the latest, and are chiefly employed. Some years ago a huge revolving cage was introduced by one of the French makers, and was exhibited at one of the early Dairy Shows, where it awakened considerable interest. Two of these are still, I believe, in use at the Jardin d'Acclimatation, Paris. But although accommodating 210 birds, the cost (upwards of £100) precludes their general use, even if they offered any advantage, which is questionable.

The Food.

"The food employed is very important in connection with the fattening of poultry, and it will be seen in all cases that what is commonly called soft food is used: that is, meal prepared by mixing with some liquid into the consistency necessary, according to the system adopted. The reason for the use of meal is that when so prepared it is much more easily digested than whole grain. This is so in any case but grain is given to fowls that have the opportunity of exercise, because it lasts longer and is more sustaining than the soft food. But to ensure successful fattening it is essential that the birds shall be kept in strict confinement, otherwise they would not increase in weight nearly so rapidly, and thus the organs of the body are not in the condition to enable rapid assimilation of hard grain. There is a great amount of difference in the meals employed. In England the food chiefly used for the purpose of fattening is what we call ground oats; in Belgium they use generally buckwheat-meal; and in France buckwheat-meal and barley-meal, with a small proportion of Indian-meal in some districts. There is no question that Indian-meal adds greatly to the bulk of a bird put up for fattening, but it forms yellow oily fat, which is very wasteful in cooking; and a bird fatted in this way is never so nice in appearance as when the other foods named are employed.

Ground Oats.

"All the meals mentioned above are good for the purpose, but we think that ground oats stand first. These contain nearly 6 per cent. of fat and a considerable amount of phosphates, (see Analyses, p. 19), which have an influence in making the flesh white, or bleaching it, and at the same time giving it a good flavour. These ground oats are prepared specially for the purpose, and several millers in the district around Tonbridge lay themselves out specially for the preparation of the meal. Up to the present time few makers in any other part of the country seem to have been able to prepare ground oats equal to those produced in Kent and Sussex. I remember many years ago trying to grind oats as good as those produced in the south of England. We used the very finest Scotch oats that could be obtained, and yet it seemed impossible to secure meal of the desired fineness. Moreover, we could not grind the husks, and therefore they were useless for the purpose. The explanation is partly found in the fact that the Kentish millers use high grade stones, which are cut very sharp and run very low; hence the danger of fire is always greater, and the speed at which they can be run is less than is necessary for the grinding of other grains. But the chief point is in the class of oats employed. English and Scotch oats, though probably better than any kind met with in the world for the making of oatmeal, contain a considerable proportion of moisture, and thus they clog the stones. Therefore the small, hard, plump, fine-skinned Russian oats are used, and it is upon them that the millers have to depend. Ground oats are rather expensive, and absolutely pure cannot be bought, even in large quantities, much under £9 10s. to £10 per ton. The cheaper meals sold as ground oats contain an admixture, generally of fine thirds. One maker supplies a meal which I have proved to be very excellent for the purpose, and this contains one part ground oats, one part fine barley meal, and one part fine Indian meal; and as it can be sold at about £6 10s. to £6 15s. per ton, it is extensively employed.

"Buckwheat meal is not quite so good as ground oats, being rather low both in albuminoids and in fat, and therefore we do not expect quite the same quality of flesh as the result of fattening by it. In Belgium, where it is generally employed, it is ground up very fine, husks as well as the floury parts of the grain, and I can quite conceive that for trough feeding alone it is excellent, being rather sweet, thus tempting the birds to eat more than they would otherwise do. As already mentioned, both buckwheat meal and very finely sifted barley meal are employed in France. The latter is not so good as either ground oats or buckwheat meal, being rather stimulating. When used it is always very carefully sifted. I have found in one or two parts of France where barley-meal is largely employed for fattening, that with it was mixed about a fourth of fine Indian-meal. In Russia fatters use ground oats or oatmeal, buckwheat-meal, and a meal made from millet seed; but many of the fatters in that country are compelled to regard that which is cheapest, because the price obtained for their birds is very low.

Milk.

"Whilst much of the success in fattening is due to the meal employed, the colour of the flesh is largely determined by whether milk is used or not, and the large amount of phosphates in the solids of milk secures that whiteness of flesh which is preferred in European table poultry. In England skim milk is generally used for this purpose, and as a rule the milk is allowed to sour before it is mixed with the meal. Why this is done is somewhat difficult to explain, and whether the system originated from actual observation, or that it was more convenient because the milk could be kept for use as required, I cannot say. The theory is that the acid generated in the milk in a sour state stimulates the appetite, prevents sickness, and gives a flavour to the flesh. Some doubt has been thrown upon this of late, and the disadvantage of that scouring which undoubtedly arises from the use of sour milk has been pointed out. But whether the same results can be obtained with sweet milk as with sour has not been practically tested, and is one of the problems that must be left for future solution. In France skim milk is employed, and generally sour; and in one district I have visited they use the whey from the curds. In Belgium buttermilk is preferred when it can be obtained. Although one may have an open mind as to whether sweet or sour milk is best, at the same time it is suggestive that in all three countries named the same idea appears to have been in the minds of fatters. The great advantage in using either sour skim milk, buttermilk, or whey from the curds, is that what is to some extent a waste product can be put to good purpose.

Fat.

"During the last week to ten days of the fattening process, that is, during the time that the birds are in the sheds, it is customary to add a proportion of fat to the food with a view of increasing the weight of the birds. If whole milk were employed fat would not be needed, but when skim milk is used because the butter fat in the milk would be too valuable for this work, then other fat should be added. In some places butchers' suet or scrap fat is bought, clarified, and then kept in barrels for the purpose. The fat which comes over from America, and which could formerly be purchased at a comparatively cheap rate, has risen in price considerably. The quantity usually added varies greatly. It is customary during the first day or two after fat is added to give only a small quantity, say a quarter of a pound per diem for every twenty birds. But this is gradually increased until each bird is getting half an ounce of fat per day. The fat should be melted and mixed with the soft food. This must be properly done, otherwise it will come out in lumps.

Methods of Feeding.

"The method adopted in preparing food for fattening does not vary to any great extent. As a rule, it is found desirable to mix the food with milk a few hours before it is intended to be used, allowing it to stand; during this time a slight fermentation takes place, which it is claimed assists the process of fattening to a considerable extent. In Sussex it is usual to mix the food for the next meal as soon as the morning or evening meal respectively has been given. In this country the birds are only fed twice a day, as early as possible in the morning, and, in the evening, about an hour before dark. Of course, the exact hours are determined by the season of the year. Whatever times, however, are chosen should be adhered to. If seven o'clock in the morning and six in the evening are adopted—and these would be very suitable during the spring and autumn—such birds as have commenced to fatten at these hours should be finished without variation. In one or two places on the Continent I have found that the fowls are fed three times a day, but this is exceptional, and there appears to be no advantge whatever in doing so. When the food is given either from the funnel or by the crammer, the operator feels the crop of the bird before feeding, and if food remains therein from the previous meal it is usual not to give any at all that time. This would be a sufficient sign to an expert crammer that the bird was unable to assimilate the quantity which he had previously given. As a rule, fatters can gauge to a nicety the amount of food which birds can assimilate, and much of the success of the work will depend upon judgment in this direction. Of course, with trough feeding it is not at all important, because the birds themselves will not eat unless they are hungry.

"It is frequently found during the process that fowls appear a little sickly, and go off their food. When this is so, it is useless continuing the process. If they are fairly well fatted, the wisest thing is to fast them at once and kill; but during the earlier stages the usual plan is to remove such birds from the pens, put them into an outside run for a day or two, giving them very little food and that hard corn, and when they have recovered they may then be returned to the pens for fattening. In the warmer months of the year a difficulty frequently arises, due to the blood of the birds becoming heated, as a result, of course, of the artificial conditions under which they are living. To prevent this many fatters add a little flowers of sulphur to the food, nothing more than a mere sprinkling or dusting; but the best thing for this purpose is to boil nettles, chop them fine, and mix them, with the liquid in which they have been boiled, in the food. Some fatters do this regularly as a matter of course, finding it very beneficial indeed in keeping the birds in a healthy state.

Fasting before Killing.

"When it is determined that the birds shall be killed, they should have no food whatever for at least twenty-four hours before an end is put to their existence. In all districts where the production of table poultry is carried out systematically, such a plan is adopted, but in districts where the work is not so thoroughly understood, there is great neglect as to this precaution. With larger stock it is always carried out by the best feeders. Many people imagine that it must be a cruel thing to keep any bird or animal without food for such a length of time, but there is no cruelty whatever involved. The fact is that a well-fatted specimen could live for a week upon its food reserves without any positive cruelty. The reasons for fasting previous to killing are obvious, and need only be mentioned. In the first place, starving ensures that the crop and intestines shall be emptied of food. In some districts where this precaution is not carried out we see birds exhibited for sale with crops full of food, and decomposition takes place very speedily, reducing the value of the birds considerably. Therefore, upon this ground alone the recommendation is one which ought always to be insisted upon. It is a recognised fact that birds starved in this manner will keep much longer than if the food remains in the crop and intestines. Secondly, the flesh of fowls so fasted eats much better. It is less liable to hardness, and we suppose that the arrestation of the process of digestion and assimilation has some influence upon the flesh throughout the body. What that influence is, however, has never been satisfactorily determined. A further point in this connection is that a fowl so starved is much more easily drawn, and certainly is not nearly so offensive during the operation. If people take the trouble to draw two birds, one which has been fasted and the other not, they will be surprised at the difference between the two. In the latter case the intestines are moist, and do not come away cleanly, whilst in the former they are dry and compact. We cannot too strongly impress upon those who are preparing fowls for sale, that this question of previous fasting is of very great importance.

"In all countries where birds are fatted they are never sent alive to market, but killed where they are fatted. At one time, in many districts, there was considerable opposition on the part of poulterers to this system. They preferred to buy the birds alive, and kill them as required, which can be understood where the demand for poultry is small. Such a plan, however, causes a large amount of the gain from fattening to be lost. To send away fatted birds alive in crates, exposing them to cold and draughts, and stopping the regular supply of food, causes a reaction, and it has been found, as a matter of practical experience, that a bird will lose in twenty-four hours as much flesh as can be added in a week. Poulterers in various parts of the country who sell fine specimens now generally understand this, and the difficulty referred to has been felt less of late years than formerly. All the fatted birds produced in Surrey, Sussex, and west Kent, and in the best districts of France and Belgium, are killed upon the spot and marketed dead.

Killing.

"The methods of killing vary considerably, and some of them are very objectionable. The plan usually followed in this country is dislocation of the neck. When swiftly and properly carried out, there can be no more humane method. The operator holds the bird by the two legs and gathers the ends of the wings in the same hand; thus the bird is unable to struggle. When so held the back should be upwards. He now takes the head between the first and second fingers of the right hand, the comb lying in the palm and the fingers closing upon the neck immediately behind the head. The neck is drawn by the right hand to its full length, the head thrown slightly back, and by a sharp but not too vigorous pull the vertebral column is broken, the neck thrown fully out immediately behind the head, the veins and nerves torn right across. Such a system ensures but momentary pain in killing, because, as the brain is the centre of all feeling, separation from the rest of the body means immediate cessation of feeling. When properly done it will be found that there is a break in the column of the neck of about an inch to an inch and a half, the head being connected with the neck only by the outer skin, which should not, of course, be torn in any way. In some parts of this country it is customary to cut the throat, and this is a very effective method, but, for reasons afterwards explained, there are objections to this system, which, however, is adopted almost entirely in Belgium. Certainly the appearance of birds in Belgian shops and markets compares very unfavourably with specimens in our own country, as they lie upon the slabs with an open gash in, and the blood marks conspicuous upon the throat. In France there are two methods chiefly in vogue. One is known as the system of paletting. In this case a special knife is used for the purpose, with a long narrow blade sharpened on both sides. The bird is tied by the legs and wings, laid down upon a table or block, back downwards; the mouth is opened, and the point of the knife is inserted into the slit which is found in the roof of a bird's mouth; it is then forced right through the brain to the back of the skull. When properly and firmly carried out this system is a very excellent one, as the piercing of the brain causes paralysis, and practically destroys the sense of feeling. I fear, however, that a good deal of cruelty arises from this method. In many cases, instead of forcing the knife right through the brain, it simply penetrates the frontal part of the skull, and does not effect the purpose; in fact, the bird simply bleeds to death. In the La Bresse country I saw a system carried out which appeared to me to be very cruel indeed. The birds were hung up by the legs to wires stretched across the killing room, and the operator—who, by the way, was a woman—opened the mouth, inserted a pair of scissors, and simply cut the veins of the roof of the mouth in a transverse direction. The birds flapped their wings, and it was certainly a considerable time before they were dead. When I objected to the method, it was stated as a reason for its adoption that the flesh came so much whiter when the blood was drained in this manner from the body, and that the flapping of wings had the effect of causing the blood to flow more freely. There can be no question whatever that a bled bird looks better than one in which the blood remains in the veins, but where a large number of birds are to be killed and plucked, the flying about of the blood is not only objectionable so far as appearance is concerned, but at the same time, if plucking takes place immediately it has the effect of spoiling the feathers, and this is an important point, as in Sussex it is generally considered that the feathers obtained from a fowl should pay the cost of killing and plucking. Up to the present time I have not yet met with any plan which would get rid of the blood speedily from the body without running a danger of loss in this way; and the system of dislocating the neck appears, taking it all round, to be the least objectionable, and to drain the body of blood to a very large extent. If in plucking the operator holds the bird in a proper manner, the head is hanging downwards, and thus the blood is draining into the space between the head and the neck. It is important that fowls which are to be kept in cold storage should always be bled. One of the most objectionable methods of killing which I have ever seen is by hanging, by reason of the fact that this causes suffusion of blood all over the body, and when the bird is plucked the flesh is perfectly red. I should be very sorry indeed to eat a bird killed in this manner.

Plucking.

"Plucking the fowls is more easily carried out if the operation takes place immediately the bird is dead, and whilst the body is still warm. It is frequently objected, by reason of the muscular action which is observed in a bird immediately after death, that it must be suffering pain; but upon this point the best veterinary authorities in the country, including the late Sir George Brown, of the Board of Agriculture, have assured me that it is impossible for the bird to have any sense of feeling after the brain is severed from the rest of the body. Hence we need have no qualms of conscience upon that score. If, however, it is impossible to pluck the birds as soon as they are dead, then they should be allowed to become quite cold before the work is carried out, for it is found that the flesh of a bird is much more liable to tear when it is *half* cold than when either warm or entirely cold. The best method of plucking is to have a seat about 20 inches in height, the operator sitting thereon, holding the bird by the legs and the wings, as already described for the process of killing, the head hanging downwards in front of or between the legs. By so doing it will at once be seen that the blood, during the time the bird is cooling, is draining away to the neck, whereas it would not be so if the bird were head upwards. The operator plucks the feathers the reverse way to that in which they lie upon the body, and the position named enables him to do so with ease. He should start upon the back, taking hold of several feathers between the thumb and forefinger of, say, the right hand, and, giving a sharp pull downwards, they come out quite easily. Of course, the knack of pulling the feathers only comes by experience; there is a way of drawing them as described, sufficiently sharp to take them out clean without tearing the skin. When the back has been denuded the bird is turned round and the breast treated in the same fashion. By this time all convulsive movements will have quieted, and thus it is not necessary to hold both legs and wings, in fact it may be held by one leg. When the breast and under parts have been completely plucked, and the neck up to within two inches of the head, each leg should be taken in turn, held straight upwards by the shank, and if the operator will close his finger and thumb around the shank and run them sharply down the thigh a large number of the feathers will come out, the others being plucked in the usual way. The wings may now be taken, the small feathers drawn in the ordinary way, but the flight feathers must be plucked either two or three at the same time, gathering them between the fingers. These require a sharp pull, given with a backward tendency. Of course, the tail feathers must be completely drawn also. The plucking of a fowl takes a shorter time to accomplish than to describe, and the regular rate in Sussex is about twelve in the hour; but I have known a turkey completely and beautifully plucked in less than four minutes, though, of course, this speed could not be maintained for a long period. The chief points in plucking are: First, that it shall be done immediately the bird is killed; second, that the operator shall draw the feathers the reverse way to that in which they lie, with a sharp pull, yet not sufficient to tear the skin; third, that the process shall be carried out as expeditiously as possible. The reason why feathers are left on near the head is simply to cover up the broken part of the neck, and also that the bird presents a rather better appearance than if plucked completely up to the throat.

Scalding.

"In some districts it is customary to dip the bird in boiling water before plucking, and there is no doubt that this makes the feathers come out much more easily, but it is objectionable for other reasons, if the specimens are to be exposed for sale. Scalding does no harm if it is intended to cook the birds at once; but if this is not the case it gives them a soft, flabby appearance, which reduces considerably their value upon the market. Moreover, there is no need for scalding, provided that the birds are plucked whilst they are warm.

Stubbing and Singeing.

"During certain periods of the year it is found that there are a large number of what are called stub feathers remaining on the body after the fowls have been plucked, and these must be removed. To do so, however, is a somewhat tedious process, because it cannot be done by the fingers alone. In the poultry districts, as a rule, women are specially employed for the work of stubbing, and they are pretty well paid, frequently receiving a penny per bird. The best method is to have a short knife, pass it under each feather, grip the feather upon the knife with the thumb, and draw it out sharply; but fatters as far as possible try to avoid killing birds in this stage, although, of course, it is impossible to do so entirely. All fowls, even when in the best condition, are found to be covered with a large number of fine hairs, and the removal of these makes a very great difference to the appearance, in fact, frequently explaining why some specimens look so much cleaner and nicer than do others. To get rid of these the bird should be singed. This is a simple operation, yet one which requires a little care. Some people use paper, but it is apt to make too much smoke, and the best thing for the purpose is straw. A small heap of straw should be made and lighted. At first it will burn with a thick smoke, but as soon as fairly alight there will be a clear flame. The operator then takes the bird by the head in one hand and the feet in the other, and passes it through the flame, turning it over in so doing, by which means it is entirely denuded of the fine hairs named. Unless care is taken, however, the process would have the effect of blackening or burning the skin, causing it to shrivel; but that can be avoided by rapid movements, as proved by the Surrey fowls which come upon our great markets.

Disposal of Feathers.

"Before leaving this part of the question a few words may be said with regard to the feathers. I have made inquiries of several feather merchants and find that they do not in any way depend upon our English supplies, in fact they prefer to purchase foreign feathers, because they can obtain them more regularly and prepared in a proper manner. It is true, of course, that fatters sell the feathers, but where they go to is a little difficult to say, and in fact we do not appear to have any firms in this country who treat feathers in the same way as is the case in Russia and Germany. The complaints which are made by merchants with regard to our home feathers are that the producers do not separate the different sizes. If they would do this, grading them according to size and texture, it would be to their advantage. What is meant is that the fine feathers on the under parts of the body should be kept distinct from the coarser feathers on the back, and certainly from the wing feathers. I suppose that what is really wanted is someone to commence a feather factory in the districts where the largest quantities are produced, and to show that more care would mean better returns. Even when properly separated, there is a considerable difference in the value. The best qualities of feathers can be sold at 3½d. to 4d. per lb., but the preference is given to white. The wing and tail feathers are difficult to dispose of, and the price obtainable for them is very low. If stripped and the quills entirely removed, they may be mixed with those from the body in small quantities. All classes of feathers should be kept free from dust and dirt, be packed in clean sacks, and sent to the merchants whilst fresh.

Shaping.

"The next step after plucking is the shaping of the fowls, and here there are various systems in vogue. That adopted in this country is simple and very effective. For this purpose a shaping board or trough is made, in size according to the requirements of the fatter. The shape of this trough varies considerably, but they all appear to have the same effect. Some of the fatters prefer shaping-boards in which the troughs are made V-shaped, as shown in the illustration, whilst in others the back board is perfectly vertical and the front board is at an angle of about forty-five degrees. So far as I have been able to see, neither form has any distinct advantage over the other, both serving the purpose equally well. These troughs are made from 2 feet to 3 feet in length, and often arranged in two or three tiers. Usually the back board is narrower than the front, 5 inches for the former and 6 inches for the latter being a regular size. They are very cheaply made and serve a life-time. When the birds have been plucked and singed they are first loosely tied at the hocks, so as to allow sufficient play at the posterior end of the sternum for the legs to lie at either side of the breast, the legs and feet are now bent downwards at each side of the breast, and the wings folded so as to lie flat against the breast in front. The bird is now held in the two hands, and it is customary to press the stern against a flat board or wall, to force in the breast by pressing it hard against the operator's thigh, and if it is a round-backed bird, to press in the backbone by the two thumbs, then to lay the bird in the shaping board, breast downwards, the head hanging over the front. The stern will rest against the back board, and the keel lie on the front board, so that any pressure from above will be upon the keel and not upon the legs or feet, as these are really out of the way. Each trough should be filled tightly with birds, and it is better if they are as near as possible of the same size. As the trough is filled, a board, about 4 inches in width, is laid along the backs, fitting easily between the upright ends. This is heavily weighted, sometimes two 56 lbs. weights being used to about a dozen fowls. The birds are allowed to remain in the shaping board for six or eight hours as the case may be, and if placed therein whilst warm, it is remarkable what a difference the pressure makes to their appearance when taken out, as they then show that square shape which is characteristic of fowls prepared in the Sussex fashion. Of course, a fat fowl will always come out better than a lean one, and in fact the system is not of much use except the birds have been properly fatted. But when so dealt with it is found that the flesh is forced upwards on to the breast, that the body is contracted, and any air or gas inside expelled, whilst in appearance there is a very distinct

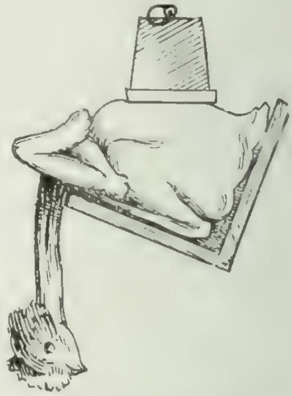

Fig. 65.—Shaping Trough.

gain, and, of course, the look of an article goes a long way in our markets. An important point is that the shaping board should, during warm weather, be in a cool place, otherwise the body heat will to some extent be retained. If that is so, when packed the birds 'sweat,' and early decomposition is induced.

"The systems of shaping abroad vary considerably, but it is not necessary to deal with them here at any length, for the reason that they are scarcely likely to be adopted in this country, and we do not see that there would be any gain in so doing. In Normandy flat single boards are used, about the length and breadth of the fowl to be placed thereon, and these boards are fitted with a row of three or four pegs or nails at either side. With them are employed pieces of fine linen cloth, fitted with tapes corresponding to the pegs referred to. When the bird is plucked it is laid breast downwards upon this board, pads of straw or paper being placed under the crop and below the tail respectively, to keep it level, then the cloth is tied tightly down over the back by fastening the tapes to the pegs. When this is done it is usually soused with cold water, and the cloth is kept damp with milk. The system practically gives the same results as the Sussex method, but the latter is much simpler, though the milk and cloth undoubtedly whiten the flesh and smooth the skin of French fowls. In the La Bresse district a very different method is adopted, and one which is peculiar to that centre. For this purpose two cloths are employed. The bird is wrapped in fine linen which is dipped in skim milk, and then is further enveloped in a strong piece of canvas, which is either stitched, or laced up by means of eyelet holes in the canvas. The shape of the cloth is broad at the stern and narrowing gradually to the neck. The feet, legs, and wings are forced into the flesh, and when the bird is taken out of the cloths, if the head were removed it would have the appearance of a small sugar loaf rather than a fowl. Here again the effect of the cloth dipped in milk is to whiten and smooth the flesh, whilst the texture of the linen gives a grain to the skin which is very pleasing. In Belgium the shaping is certainly unique, but it is not to be recommended for that reason. The birds are simply squeezed flat; and in many cases, were it not for the head and neck, they would not look like fowls at all.

"This leads us to the consideration of the practice of breaking the breastbone, a system which unfortunately is carried out to a considerable extent by poulterers in this country. The work is often very carelessly done, and there is no need whatever for this breaking of the breastbone, nor does it deceive anyone. Frequently, as a result, the meat upon the breast is cracked right across, and in carving falls into two pieces. A fowl which is not sufficiently improved by the system of shaping already described can never be a good fowl, and everyone, both producers and consumers, ought to set their faces rigidly against the system of breaking the breastbone. What appears to be most required in connection with the finer preparation of fowls, is that the system of shaping shall be introduced throughout the country; and, further, if fatters would take the trouble to wrap their birds in cloths dipped in milk when placing them in the shaping board, it would have a wonderful effect upon the appearance of the specimens.

Packing.

"The method of packing varies considerably, and there is no special advantage in one mode over another, provided that certain points be carefully observed. In Sussex the fatters use what are called 'pads'; these are made of light laths fitted into a frame, and the inside lined with thin strips of wood. These certainly carry the birds firmly, but many fatters prefer baskets or hampers, and so long as the packing is well carried out either one or the other is equally satisfactory. The baskets should be lined out with straw or wood wool, and the birds firmly packed therein, so that they will not move about. The package must be completely filled up, otherwise there is great danger of barking or breaking the skin. In many cases producers lose money because they do not carry out this part of the work satisfactorily.

Marketing.

"In the south-east of England the marketing of the fowls is organised most completely. At Heathfield, Uckfield, and elsewhere are carriers who regularly visit the fatters, receive the packages, convey them to the station, consign them to the salesmen, and in many cases receive the money and pay it over to the respective senders. At one time, before the railway period, waggons used to leave every night for London, but now the packages are sent by rail, and usually the cost of cartage and of railway carriage does not exceed one penny per bird. The importance of this industry is recognised by the railway companies, who provide special accommodation for it. Some time ago the rates were raised, but a threat was made that the old carrier system would be again introduced, and as a result prices dropped to their old point.

"The method of disposal usually followed is to consign these fowls to London salesmen.

and on the whole this works satisfactorily. Of course complaints are frequently made, but it must be recognised that salesmen can frequently obtain better prices from poulterers than could the fatters themselves, by reason of the fact that they grade the birds in accordance with the requirements of buyers, which would scarcely be possible as a general rule amongst the fatters. This is a point, however, which it is beyond my province to discuss.

Capons.

"Both at home and abroad large numbers of fowls are sold under the name of capons, and these command the highest prices. In France we see quoted capons and poulardes, but the latter term is not met with in our own country. It is necessary, before saying anything as to the system, to consider what these terms really mean. The system of caponising, that is, destroying the reproductive faculty, has been carried out for several centuries, and, so far as evidence is obtainable, was practised to a considerable extent two or three centuries ago, but it must be recognised that the word has now largely lost its old meaning. What are called Surrey capons have not, as a rule, undergone the operation, but are simply large and more fully grown birds, distinct from what are called chickens. Although some doubt has been thrown upon the statement, there is no question that large numbers of cockerels are caponised in France, but probably not to the same extent as was formerly the case. In America it would appear that of late years the practice has increased, but I am inclined to think that everywhere only a small proportion of the dead fowls which go under this name, either at home or abroad, can legitimately be designated as capons. The term poularde has no real meaning. At one time it would appear that in France it was customary to a limited extent to destroy the ovaries of pullets, with the same object in view, but I have been unable to find that this is now practised at all. Speaking generally, we may therefore assume that all large, well-grown fowls of either sex, when given the designation mentioned, are chiefly matured specimens, and that these names are used in the same way as is mutton in contradistinction to lamb, to indicate the age of the animal from which it is obtained. The value of caponising, however, we cannot ignore. All the evidence to be obtained goes to show that the effect of the operation is a beneficial one so far as the quality of meat is concerned, and fowls treated in this manner retain the tenderness of chickens for a much longer period than would be the case under natural conditions. But there is a further advantage, especially in the case of cockerels. Everyone who has had any experience with the rearing of fowls in large numbers knows the difficulties arising in keeping cockerels, and upon that ground alone there would be sufficient justification for the adoption of this system. Where operations are upon a smaller scale, and especially in establishments where enclosed runs are employed, it is not at all difficult to keep the cockerels altogether apart from the hens and pullets. This, however, is not so upon farms, where the birds have liberty, and many complaints have been made as to the trouble arising in this way. The principle is one that is recognised in the case of larger stock. It would be an impossible thing to keep a considerable number of young bulls upon a farm, and hence they are castrated at an early age. Whether the process is a paying one must depend upon many things, chiefly whether demand can be obtained for large birds in the autumn months of the year, at prices giving an adequate return for the food and labour expended in keeping them right through the summer.

"Caponising is of no use whatever for chickens, and should be only employed when it is intended to keep the birds until they are eight or ten months old before killing. A chicken would be in fit condition for fattening about the time when the operation should take place. The effect of this operation is to retard the growth, but at the same time to prolong it; and although some experiments have been made in America at the Rhode Island Experiment Station which did not warrant the statement that capons ultimately make larger birds during the first year, there is ample evidence on the other side. In France there is a very large sale for birds immediately before the beginning of Lent, as Shrove Tuesday takes the place of our Christmas feast to some extent. For that festival fowls are in considerable demand, and, as these must be nearly twelve months old, it is found that the capons make much the finer birds, larger in size and better in meat qualities. Many people imagine that young birds may be caponised and marketed within a few weeks. This is an absolute mistake, and it will be found that such capons would be less profitable than if fed and sold off as cockerels. There can be no question that the operation is one which requires skill and care, but the amount of pain is very small, and, as a rule, birds suffer a comparatively small amount of inconvenience. In the La Bresse district of France, at certain seasons of the year people—chiefly women—go round to the various farms and undertake the work of caponising at so much a bird, usually, I believe, about 20 centimes. When skilfully carried out the loss by death is very small, and I have known those who did not lose more than 2 per cent. in this way. Taking all things into consideration, it must be acknowledged, however, that the chief value of caponising is found in the ability to retain male birds for killing in the autumn without keeping them in confinement. The gain in weight probably does not make any great difference so far as actual profit is concerned.

Caponising.

"The period at which the birds shall be operated upon will depend upon the breed, as some mature much earlier than do others. A few breeds, such as the non-sitting varieties, which are rapid in growth, should be operated upon when about ten weeks old, but others of the slower developing breeds will not be ready until six weeks later. The best guide is when the comb just begins to spring, showing that the organs are coming into activity. It is usually the case that cockerels commence to crow at this period, and this also may be taken as an indication of the right time for caponising having arrived. When selected, the bird should be kept without food for about thirty-six hours, in order that the intestines may be entirely emptied. A proper set of instruments should always be used, which can be purchased from such firms as Spratt's Patent at 10s. 6d. the case. These instruments include a knife, a pair of spreaders for the purpose of holding open the cut, and a pair of grippers by which the organs are seized and wrested from their connections. For this work it is desirable to have a good firm table, or if a barrel is placed end upwards and a square board laid on top, it answers the purpose excellently. The table or barrel should be placed where there is a good light, otherwise, when the cut is made, we cannot see the position of the organs very easily. An American writer recommends placing a small mirror on the forehead, and states that by this means he can operate even upon a dull day, but I am inclined to think that this is an exaggeration. Two pieces of soft cord about 3 ft. in length, and also a couple of half-bricks as weights, a sponge, and a bowl of cold water are required. A running loop should be made at either end of the cords, and to each cord is attached by means of one loop the weight named. The loop of one of these cords is slipped around both legs of the bird by the middle joint, and the vacant loop upon the other cord is placed around both wings close up to the body. The bird is then laid upon its side with the back towards the operator, and so soon as the weights are passed over the end of the table or board, hanging down at either side, the bird will be held firmly and cannot struggle or move ; thus the operator can handle it with the greatest of ease. As a rule, I have found that birds treated in this manner do not attempt to move. The operator now plucks some of the feathers from the side, immediately in front of the thigh, from the ribs down to the breast. The sponge dipped in water is used for wetting the feathers around the bare place made, thus keeping them out of the way, and it also has the effect of numbing the flesh of the bird. The fingers of the left hand must find the first and second ribs, and a cut is made with the knife between them, from the back downwards to the end of the ribs. If this is properly done, immediately there is a spreading of the skin and thin layer of flesh, greatly assisting the operator. The spreader is now placed between the ribs, and the bent ends of the steel of which it is made grip the ribs, drawing them also apart and leaving an orifice of quite an inch. The first thing seen inside is a very thin skin or membrane, which has to be split by the point of the knife. When this is done the testicle will be seen immediately below, but close up to the backbone. It is of the shape of a bean, varying, of course, in size with the age of the bird. The reason why it would not be wise to operate too early is, that this would be so small that it would be scarcely noticeable, growing with increased age. The usual course is to insert the grippers, pass them around the organ, taking hold of the ligature by which it is attached to the other parts of the body. When this is done a sharp twist detaches it. If larger, I have found that frequently it can be removed more easily by the finger and thumb. It is necessary to take care that it is not lost, otherwise serious complications would arise. So soon as all has been done on one side, the bird is turned over and the process repeated on the other. There are some who prefer to operate upon both organs from the same side, but I have never found this so easy or expeditious as making another cut. After the operation, as no stitching is required, the bird is released, and should be placed in a large shed or house, well littered with straw, but with no perches ; and it is a very wise plan to give it a good feed of soft food immediately, as of course it will be very hungry, having been starved previously. It should remain in this place for about a week, but as a rule, in three days it will be found that the cuts have closed up and healed. Such, briefly described, is the method of caponising ; but all those who intend to practise it should receive at least one practical lesson, and then experiment at first upon dead fowls, in order to learn the exact position of the various organs.

Milk Chickens.

"In some of the countries of Western Europe during the spring months of the year a limited amount of trade is done in what are termed *petits poussins* or *poulets au lait*, or 'milk chickens.' These birds range from a month to eight weeks old, and vary in weight from 8 oz. to 12 oz. They are dressed in the same way as a pheasant, and each guest is served with the whole bird. For such small birds during the London season the demand is fair, but there does not appear any tendency to increase, which may to some extent be due to the lack of supplies. Still there is a limited market for really good specimens at excellent prices, but it is not a branch of the poultry industry which is capable of great development. In France the sale of these birds is much greater, and large quantities are produced in the department of Seine-et-Oise. But in all questions of this kind we must consider the different habits of the people, and French dishes are prepared with less meat and more accessories than is the case in this country. The price varies in accordance with the quality, but 1½ to 2 francs is paid for ordinary specimens, better birds reaching 3 and 4 francs. In London such birds sell at from 1s. 2d. to 2s. 0d. each. A large number of these *poulets au lait* are sold in Belgium, and it is a special industry undertaken by a few persons, who are very skilful in bringing them forward. Many of the Belgian birds are killed a little larger than is the case in England and France, but some are very small and dainty. In England the sale of these birds is between Easter and the beginning of July, and it is a purely metropolitan trade, but in both France and Belgium the season is somewhat longer.

"For producing the best quality of milk chickens it is necessary to have a quick-growing, light-boned fowl, and at the same time one which by habits and temperament is suitable for the restriction necessary. It has been found that crosses between the Indian Game and the Dorking, or the Houdan, make plump, fleshy birds at four to six weeks old, and the Buff Orpington is also very useful for this purpose. In France the *petits poussins* are chiefly Faverolles. At one time the Houdan was chiefly depended upon, but the greater vigour of the Faverolle, and the fact that they have to a very large extent taken the place of Houdans, explains why it is that birds of this class are so strongly in evidence. It is to the Belgians, however, that we owe the most advanced knowledge upon this part of poultry culture. Instead of depending chiefly upon what are known as the table class of poultry for the production of *poulets au lait*, the breeders of that country find that the non-sitters give better specimens at an early age. For one thing they are lighter in bone, but the chief reason is that they are much more rapid in growth, maturing at a very early age. It is well known to breeders that the combs of the non-sitting varieties spring much sooner than is the case with any other class of fowl, that the chickens are very precocious, and that development is quick. Such has been our experience with Leghorns and breeds of the same class. At the Poultry Conference held at Reading in 1889 M. Vander Snickt, of Brussels, explained the economic value of the cock crowing contests which are common in Belgium, namely, that this was a sign of rapid development and of early maturity. And it is a striking fact that at the Smithfield Table Poultry Show of the same year, in the class offered for *petits poussins* or *poulets au lait*, the exhibits from Belgium were not, as might have been expected, Coucou de Malines, the great table fowl of that country, but Braeckel, Braeckel cross, and Campines, and the quality of these birds was acknowledged by the most prominent poulterers.

"So far as the hatching of the small chickens is concerned, this must be done in order to meet the market demands. As already indicated, the sale in this country is from April to the beginning of July, and consequently this fact must be kept in view, as it is no use marketing them either too early or too late. Where cockerels of non-sitting breeds are used, the regular hatching season fits the demand. In some cases when the sexes have declared themselves, provided the variety were one to show sex so early, breeders might keep any of the pullets required for other purposes. As a rule, however, it will be found better not to regard this question at all.

"Those who go in for the production of *petits poussins* will require to make provision for the birds, and to start at the very outset to feed them upon food that is calculated to develop flesh rather than bone. It has been claimed that the best method of securing good birds is by keeping them absolutely under cover during the whole period, but such a system has dangers which only the most skilful can avoid. During a cold wet spring there can be no question that a good, roomy, well lighted, and well ventilated chicken house is of great service. By this means the birds are sheltered against adverse influences which would check their growth, and provided that they have plenty of air and are not too strictly confined, will be quite happy and contented under these circumstances. Above all, there must not be that check to growth which is the result of conditions such as have been already mentioned. Further, we must bear in mind that as the birds are to be forced to some extent they will not be able to stand severe weather as would those raised under more natural conditions.

"So far as food is concerned, this varies considerably. For the first fortnight they are fed in the usual way upon good nutritious food, and in this respect there is nothing more valuable than oatmeal, which contains the elements required for the building up of a framework upon which the flesh will afterwards be laid. At the end of two weeks they should be fed upon ground oats mixed with milk, and if this milk is heated, but not boiled, before it is added to the ground oats, that will materially assist the digestion. A small quantity of fat is added to the food daily. In all branches of poultry raising the wisest plan is to give as much food as the birds will eat readily and not allow it to stand before them, for by so doing there is also a tendency towards sickness. Very fine grit or coarse sand is of service in assisting the process of assimilation, and if the birds are supplied with anything to drink, this should be in the form of sweet milk. In France barley-meal mixed with milk is chiefly employed, and in Belgium also. The following quotation is taken from one of the Belgian papers (*Journal des Campagnes*), which gives a recipe for breeding milk chickens, and according to the results indicated this is a very remunerative industry. 'Milk forms in this process the basis of the food given to the chickens. The diet is exclusively composed of barley-meal, cooked in skim milk, and in such a way as to form a sufficiently smooth paste. One thus obtains specimens with very fine and delicate flesh before being sold for consumption at about the age of two months. According to M. Roullier, the well known specialist breeder, the milk chicken will advantageously replace the partridge. There is one condition which is absolutely necessary in order to obtain the best results: it is necessary that the chickens shall be constantly and exclusively fed with this milk diet. At the end of six weeks they are plump and heavy; they should then weigh about 14 ozs., and at two months about 1½ lbs. These chickens can be sold at high prices, and their production would be advantageous where the breeder possesses a market for them.' It will be seen from this statement that, as already mentioned, the size of birds in Belgium is rather greater than preferred in Paris and London, but they can be killed when sufficiently large.

"Whatever the time selected for killing, the birds should be starved for a few hours, carefully plucked, tied up with a piece of fine string or tape, so as to throw up the breasts, and packed by the dozen in boxes. When sent to market they are not drawn, this work being left to the poulterer. It is most important that all the birds put into one box shall be about the same size, and as near alike in appearance as possible. This considerably enhances the returns, because customers purchasing prefer to have the birds as near alike as they possibly can. The boxes employed should be shallow, so as just to hold one tier, and the French system of having these boxes lined with lace paper adds greatly to their appearance.

Poulets de Grains.

"In Belgium a large trade is done in birds which go by the name of *poulets de grains*. These are the birds referred to previously as about two months old and weighing about 1½ lbs. each. I have found a difference of opinion as to whether the non-sitters or the table varieties are better for this purpose, but the evidence appears to be in favour of the table breeds. At a recent Smithfield Table Poultry Show the first and second prize birds in the class of *poulets de grains* were Coucou de Malines, whilst the third were Braeckel; and some of the Belgian breeders say that for the more advanced specimens the Coucou de Malines is decidedly superior. This seems to be in accordance with what might be expected, because the flesh of the slower growing varieties at eight weeks would be superior to that found upon the lighter bodied chickens, the latter having developed more in bone. In America what is known as the 'broiler' trade is a very extensive one, and in the State of New Jersey great quantities are produced every year; but in England there is only a certain amount of demand for this class of bird used for broiling, or what is frequently known as 'spatch-cock'—that is the bird, after being drawn, is split down the back and laid open, without being actually divided. It is cooked upon a grill, and certainly there is no more delicious form of preparing birds for eating. At the present time, however, this trade is a comparatively small one."

In the above article Mr. Brown has dealt with the chief practical details of producing and marketing poultry for the table, and we have only to add notes upon certain points from personal investigation, and some remarks

Developments in Sussex.

upon aspects of the subject which he has not treated of. During late years, poultry fattening in Sussex has been developing somewhat new phases, besides considerably extending; and in the September and October of 1900 we went (by the aid of our trusty tricycle) over a large part of the district, with the object of obtaining information about these, and especially about that production of ground oats upon which the Sussex industry so largely depends. Our introductions were sufficient to obtain what we desired in nearly all cases; but we were sorry to be confronted almost on the threshold of our inquiries by evidence of the real harm that had been done by certain writers upon this subject, who have sought to strengthen their attacks upon what they are pleased to term "poultry-farming," by exaggerated descriptions of the profits to be made by poultry fattening as apart from it. The result has been to induce persons who knew nothing of the business, to embark in it after perhaps two or three months' "tuition," or sometimes without even that, only to give it up after eighteen months or so, with much loss even to themselves, but having done evil which has not stopped there. These novices entered into competition as regards both buying chickens and selling them, with others who did make a living by it, and by their unwisdom and ignorance have raised the price of the lean and lowered that of the fat ones; not perhaps to any large extent, but enough to make a perceptible difference to those seriously engaged in the industry. Various examples were mentioned to us; and in the very rare instances where information was refused in response to our own inquiries, such reasons were avowed for the refusal.

Fattening a Critical Business.

This business is one of all others not to be rashly entered, least of all by the very class who seem most anxious to do so. It cannot be learnt in a few months, as they seem to think.* Much of it can, of course. Mr. Brown has described the pens, and the food, and other matters; and for years we have had all such details at our own finger-ends; yet we would view the prospect of having to embark in such a business with absolute dismay. For such knowledge alone will not enable anyone to make it pay; what is above all needed is that instinct, or rather intuitive knowledge, born only of first-hand experience, which enables the practical fatter to know what is each day required for each bird: if one has rather too much food, or another too little, or another has had what fatting it can stand, or another is slightly ailing. Then the fatter must also know what amount of work ought to be done by his assistants, and how to get that much out of them without ill-will; what a chicken he buys is really worth; at what stage his fatted bird will pay best to sell, and so on. To know about these things theoretically, is not really to know them practically; but in many Sussex families they drink it all in with their mother's milk. Finally, it cannot be said too emphatically, that fattening is neither an easy business, nor a very "nice" business for the class who seem so specially anxious to embark in it. When we come to the sour milk, and rendering the fat, and killing, and plucking, and other things, it is well to consider what the business is *like*, before going into it; for it cannot all be seen to by deputy. And it means work early and late; for idle hands cannot be afforded, and the profits are not what many suppose. The very best, pay the best, and a first-class fowl at 7s. 6d. pays very well; but the demand for such is only limited, and the top of the ladder is not gained in a hurry. The margin is very narrow indeed now, for a large quantity of really good birds; such as form the greater portion of the birds sent up from Sussex, and always must do so. To take a concrete case: one fatter who usually sends up five dozen three times weekly, and at that season* was sending only four, or twelve dozen per week, had to pay 1s. 9d. each for his chickens; the carriage and commission would be 3d. more, and he expected to get 3s. That would give him 1s. on each bird for food, labour, rent, and his living or profit. It will be seen how little would turn the scale.

Fattening on the Increase.

This narrowness of margin is one of the recent phases of the industry. Years ago the same fatter just mentioned, for similar chickens, which were bought in the neighbourhood and not Irish, would have got 6d. more increase of cost, and had, say, 1s. 6d. to "play with." The fall has been partly due to the cause above alluded to (which we have emphasised because *requested* to do so by some of those affected by it) and partly by increased supplies, the demand for which is, after all, not unlimited. On the other hand, ground oats is now cheaper, and cramming machines save much in labour; but for these two economies, many stated that they could not now make it pay. In reference to this, several complained of the high cost of cramming machines, and were glad to hear from us that Mr. Tamlin was putting on the market a simpler pattern at the considerably lower price of £2 17s. 6d. In spite of all, however, the industry still increases even in Sussex, to say nothing of growth in other parts of England. In Mr. R. H. Rew's report of 1895,* it is stated that the total of dead poultry sent from both Heathfield and Uckfield Stations in 1893 was about 1,840 tons. In 1899 there went up from Heathfield alone to London only, the station-master informed us, nearly 2,500 tons; but besides this there had developed recently a quite considerable local trade. Formerly nearly all the poulterers (not quite all) at seaside places ordered their "fed" poultry from London; but in the year 1899 no less than 475 tons had gone from Heathfield to Brighton, Eastbourne, and other resorts.

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* Mr. Rew mentions a case where a small farmer in the district itself, determined to add the fattening business to the rearing he was already carrying on. He sent his son, a bright lad, away for *two years* to learn about this in the fattening sheds, and only then started in it at home.

* September is not a very good time of year, and many fatters, at the time of our visit, did not care to send up more supplies than were advisable to "keep their market."

Partly to meet this increased demand, and partly to get a little more margin of profit, the number of Irish chickens imported into Sussex has greatly increased. Some of the larger fatters profess to scorn the idea of ever using Irish chickens, and use some fictitious initial for their crates instead of their real names; but at Three Bridges we traced many crates on their way down to various well-known names.

Mr. Taylor, alluded to on p. 135, has perhaps now (1910) one of the largest establishments; he collects most of his lean chickens locally, has accommodation for 4,000 fattening birds, and markets in the season more than 1,200 weekly. Besides using the milk from twenty cows on his own farm, Mr. Taylor spends about £5 a week on skimmed milk, and uses three tons of Sussex ground oats weekly.

Rearing Combined with Fattening.

The local rearing of chickens for table purposes has increased greatly owing to a comparatively recent development of the industry. It has often been stated that those who rear do not fatten, and that those who fatten do not rear, with the exception of such cottagers as rear and fatten a small number each. That state of things has been gradually changing, and there is now a large and increasing number of farmers in Sussex who not only fatten, but also rear a considerable number. This is partly owing to the reduction of profits causing a desire to get the double profit upon each bird; partly to the necessity felt by farmers of finding something that "paid better" than their farming (this motive was stated to Mr. Rew so far back as 1894); and partly to the knowledge the Sussex farmers have now acquired as to the real value of poultry manure.

One of the pioneers in this movement was Mr. Nelson Kenward, of Waldron, who was reported by Mr. Rew to be rearing in 1894 about 8,000 chickens upon his 200 acres of land. In 1900 we found him still raising about the same, which he regards as about his practicable limit, keeping in view due rotation of other products for sweetening the land; but he was doing as much as ever, and occasionally realised 7s. 6d. for some of his best fowls. Mr. Rew also reported 600 chickens as reared upon 27 acres, the same number upon 19 acres, and found 500 at one time (equal to from 2,000 to 2,500 during a whole year) upon 56 acres. These were recent developments then; we found rearing as well as fattening now carried on by many more. On a farm of 80 acres near Uckfield there were (at end of September) about 1,000 chickens of all ages; some nearly ready for the cages, while the youngest were only just hatched, and destined for the January and February market; this would equal four or five times as many in the whole year. On a small farm—22 acres—near Horeham Road about 2,000 eggs were set every year, and as many reared from them as possible, the balance required being purchased. Another fatter in a fairly large way at Warbleton reared for himself about 5,000 on a separate holding of 40 acres, away from his fattening place; and we learnt from him the simple explanation of what has been so often foolishly laid down as a mysterious law of Nature, to the effect that rearing and fattening "cannot" be carried on upon the same holding. At the present day it often is so carried on; but, as Mr. Haffenden pointed out, most of the fatters' holdings are small, and held for the express purpose of using up the manure made by many hundreds of birds fed in pens. Hence that land has already what manure of this kind it can possibly stand, and is "sickened" for running chickens upon besides; if they are to be also reared, therefore, there must either be another holding or a much larger one. Incompatibility from any other point of view there is none whatever, and the system of combining both profits is greatly extending.

Increased Value of Fowl Manure.

The marked appreciation of the value of poultry manure, was another interesting point. About 1885, we found no case of any being actually sold in the district for cash, and the larger fatters occupied land almost for the sole purpose of doing something with it. Its marked effects upon most crops, but especially upon the growth of good grass on poor and scrubby soil, has however had effect, and a great deal is now sold; but the curious thing is, that the nearer the customer, the less is realised. The fact is that those who can use it, prefer to do so on their own ground, while those who sell to neighbours, are small men who have no land and *must* get rid of it, but have not enough to be worth sending away, while their immediate neighbours, of course, are already supplied with as much as they can well use. We found various fatters of this smaller class who sold it at from 3s. to 7s. 6d. per cart-load, the latter the highest price we met with of this kind. A large fatter had told us before this, however, that he had himself been offered 20s. per ton, and had refused it; and we found one fatter who had sent his away at 15s. per cart-load, though he now preferred to use it himself. But we ascertained more which somewhat surprised us. Near Worthing and Angmering we heard of poultry manure *in railway trucks;* and at once came to the conclusion (as yet only supposition) that this was connected with the large and special cultivation of tomatoes and grapes under glass, which distinguishes that neighbourhood. Reserving that point for the present, we traced those truck-loads of manure back to Heathfield; and through the railway authorities there learnt that they came from a very large fattening establishment at Warbleton, which has been often described by past writers on this subject. We did not learn what price was paid for these consignments, but the very next day visited another fatter in a smaller but still considerable way of business, who told us that a year or two before he had sent his own manure away by rail at the price of £2 10s. per ton; until his customer supplied himself elsewhere, and so he had lost that market. And upon this same fatter's farm, now, we found seven glass-houses recently put up, *under which he was himself now growing tomatoes.* We need not point the practical conclusion; and will only add that we regarded the upshot of this particular investigation as one of the most suggestive in several ways.

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* Report by Mr. Henry Rew (Assistant Commissioner) on the Poultry Rearing and Fattening Industry of the Heathfield District of Sussex. Price 3d. London: Eyre and Spottiswoode, 1895.

Present Sussex Fowls.

Increase in rearing, naturally leads to the question of the local stock. We regretted to find that the fowl once known as the "Surrey" breed, a kind of Dorkingised barn-door, which made the finest market fowls in former days, had practically died out. This breed, as we knew it, had delicate white legs with, as a rule, only four claws, was very broad and square, and of varying colour, but chiefly brown or bay, more or less speckled with white and black. Unfortunately, exhibition breeders (so often decried!) had never taken up this fowl seriously, and thus it has almost vanished. Mr. C. E. Brooke told us that of all the thousands of birds he purchased for his pens at Baynards, not five per cent. were of this race. Other fatters told us the same; some said there were none at all to be had, and in all the sheds we saw, there were scarcely any. The very few we could find alive, were on the holdings of those who reared as well as fattened, but they did not seem now to be very specially valued. On one farm already mentioned, where 2,000 eggs were set—that of Mr. R. Roger, Highlands, Horeham Road—we found about ten really fine hens and pullets, and learnt that a few years back they were kept up, but lately he had taken a fancy to breed lighter colours and whites, and rather let them go. We did our best to impress upon him (and one or two others) the value that was being now set in many quarters upon this old breed, and that perhaps even selling sittings of eggs might be remunerative; and made so much impression that in this case at least, an effort was promised to breed the stock again, in view of supplying it if required. But there could not be a better illustration of the need there is for the work and enthusiasm of the genuine breeder.

In place of this old breed, a *new* local race was manifest everywhere, truly indigenous throughout wide districts. The hens are very light buff or wheat-colour, approaching sometimes almost to white, the cockerels much darker, of red and black colour. The colour, and the full fluff behind, and the character of feather, show unmistakable Cochin foundation, which in most of them also appears in scanty leg-feather; but the breasts are deep and long, and the legs have become white, partly owing to selection by the farmers, who choose white legs, and partly to soil and food, which have unmistakable effect that way. All the fatters told us that they preferred these birds to any others now procurable, as they were "good doers," and shaped well; and the fact is a curious proof that although the Cochin cross worked havoc in table poultry when first introduced all over England, a foundation of it has since gone to form, when better tempered together, some of the best table birds. The lightest of these birds, with crosses of whites, have been developed by Mr. Godfrey Shaw and others into the Albions (now White Orpingtons), which is therefore originally a Sussex fowl. Of all the sheds visited, we should say that roughly about one-third of the pens were occupied by these light Sussex fowls, which are generally ascribed to Kentish origin, one-third by crosses with Plymouth Rocks, and one-third by crosses of the

Light Brahma, which was much liked. In the Irish chickens the Rock cross predominates; in the local, the Light Brahmas (next to the Sussex stock just described). All have gone to white legs on the Sussex ground. The Buff Orpington is also being introduced, and is much liked: here also we have a measure of Cochin blood in a first-class table fowl. Several had tried the cross between Indian Game and Dorking, and with singular unanimity they did not seem to care for it. They admitted that the produce made the finest fowls, if reared to the proper age and properly fatted; but the birds did not, they said, suit the *average* Sussex system, or "pay" so well under it, a point which will be more fully discussed a little farther on. A few were kept for special fowls at the top price.

Sussex Ground Oats.

We may pass now to the food given to the birds, and first of all under that heading to the *ground oats* so universally used in Sussex, in which the entire grain is ground up into fine meal without taking any of the husk out, yet with no husk at all visibly apparent. Writers have discussed whether the Sussex poultry fattening arose from the peculiarly suitable Surrey fowl once common, or whether (as Mr. Rew thinks) the industry created the fowl; the real fact is that this peculiar meal is the basis of both, and that the poultry industry now dominates the milling of the county, the mills running much more on oats and kindred grains than upon flour.[*] The more extended production and use of this admirable meal, we are satisfied, is intimately connected with the profitable extension of poultry-feeding into other districts of England; but many attempts to produce it in other localities have failed, so far as we are aware, and various statements have been made as to the nature of what has been written of as a mysterious secret. Some have said that partially worn stones—neither freshly dressed nor worn down—are employed; others that the stones must be very closely run, at great risk of fire; others that special grain must be used, such as the Russian oats mentioned above.

The great and general importance of this part of the subject deserved special investigation, and by the aid of introductions kindly furnished us by Mr. C. E. Brooke and several others, and great courtesies shown in response by several Sussex millers, we were enabled to learn everything about this matter in the actual mills, where all was explained to us, and we saw stones dressed, and were able to sketch on the spot the illustration on the next page. None of such explanations as mentioned above are correct, the stones being used quite newly dressed until re-dressing is required, and American oats being ground as often as Russian, both being taken chiefly for cheapness, and English oats being also used, though the black oats common in the county are not suitable for this purpose, giving the flesh a bad colour. We also found distinct differences in the meal produced, and in milling practice, to be curiously distinctive of different localities; and, finally, we found that even in Sussex certain smaller mills turned out samples with considerable husk in it, and that, where this occurred to any extent in the meal used, rearers complained of deaths amongst their very young chickens in consequence.

Before discussing stones and methods, another point requires mention. What is usually sold as "pure" ground oats is not *absolutely* pure, but contains a certain per-centage of barley. It is not done for economy, for the barley costs as much if not more; but this grain is so much drier in character, that it assists grinding a great deal. The usual mixture is one sack of barley to eight sacks of oats for what is conventionally called "pure" oats.[*] This is so little that it would hardly be noticed in a handful of grain casually taken up, and besides the help in grinding, such a mixture is positively preferred and found better *as food* by most of those who use it. Much beyond this proportion, however, is found to "heat the blood" of the chickens, as it is termed, the birds beginning to peck themselves and each other, which is most injurious to fattening; such greater mixtures (not made for economy in grain, but because still easier to grind) are not considered fair if sold as "pure" ground oats. Oats are, however, also ground really pure, but at a rather higher price, because requiring more care as to speed and precise distance of the stones. It will be seen from these facts that a consumer will do well to be definite as to what he is purchasing.

The really fundamental matter is the dressing of the stones, and Fig. 66 represents a mill-stone as dressed for oat-grinding by the Sussex millers. The stones always used are Peak stones from Derbyshire, and as a rule about four feet in diameter. We found in various mills stones with as few as eight "quarters" or sections, and as many as twelve; but the ten quarters here shown were the most general, the stone being sketched in the steam mills of Mr. Hampton at Heathfield. What is called the "draft" (or inclination) of the "leading" furrows is laid out from a central circle of about four and a half inches diameter for a four-feet stone, and the width of the furrows in proportion to that of the "lands" or raised flat portions is about as two to three. So far there is nothing peculiar; but instead of these "lands" being "cracked," or dressed into parallel fine grooves as for flour milling, they are "stitched" or covered all over with little pits by hand strokes of a very sharp-pointed hard steel pick, as shown in the figure. The surface or space round the eye of the stone is somewhat lowered or hollowed as usual, that the grain may enter freely and get cracked before being ground between the closer surfaces as it travels outwards.

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[*] Even in France, it will be seen later on that increase of poultry production has been accompanied by an increase in the area under oats.

[*] In Messrs. Thorpe & Son's latest plant at Rye, by means of a fan attached to the elevator that conveys the meal from the stones, and an "exhaust," much of what is termed the "sweat" is carried off, with the result that it is found that only $\frac{1}{16}$ part of barley need be incorporated.

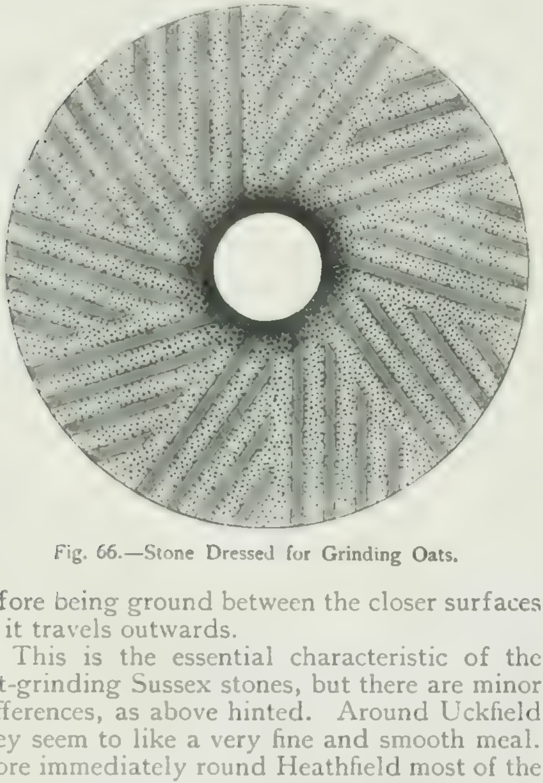


Fig. 66.—Stone Dressed for Grinding Oats.

This is the essential characteristic of the oat-grinding Sussex stones, but there are minor differences, as above hinted. Around Uckfield they seem to like a very fine and smooth meal. More immediately round Heathfield most of the fatters rather disliked this, preferring a somewhat coarser grain which can be felt between the finger and thumb, but still with no visible husk in it; they considered that this kept the bowels in better order. In the Buxted mill the stones were accordingly dressed with a lighter pick, run low or close together, and left smoother round the margin; thus the grain is cracked by the inner zone, ground by the middle zones, and the meal "smoothed" just before delivery. The result was a meal nearly as fine as flour, but not in the least what is termed "killed," and the stones were run at about 130 revolutions per minute. At Edenbridge in Kent they also use the light fine dress, and grind pure oats into the finer meal. The Heathfield stones were dressed coarser, with a heavier pick; but there was a further difference in the milling, due to the same desire for a rather coarser-grained meal. The running stone was adjusted rather higher, or at a greater distance, so that the meal came out with a certain small portion of unground husk in it. This was automatically sifted out and returned between the stones along with the unground grain, which it assists, and is the second time entirely ground, so that none is taken out in the end. This method is supposed to yield certain advantages, and the stones in this mill were stated to be run at 170 revolutions. In the mill at Rye, by means of belt-driven machinery, 200 revolutions are now attained.

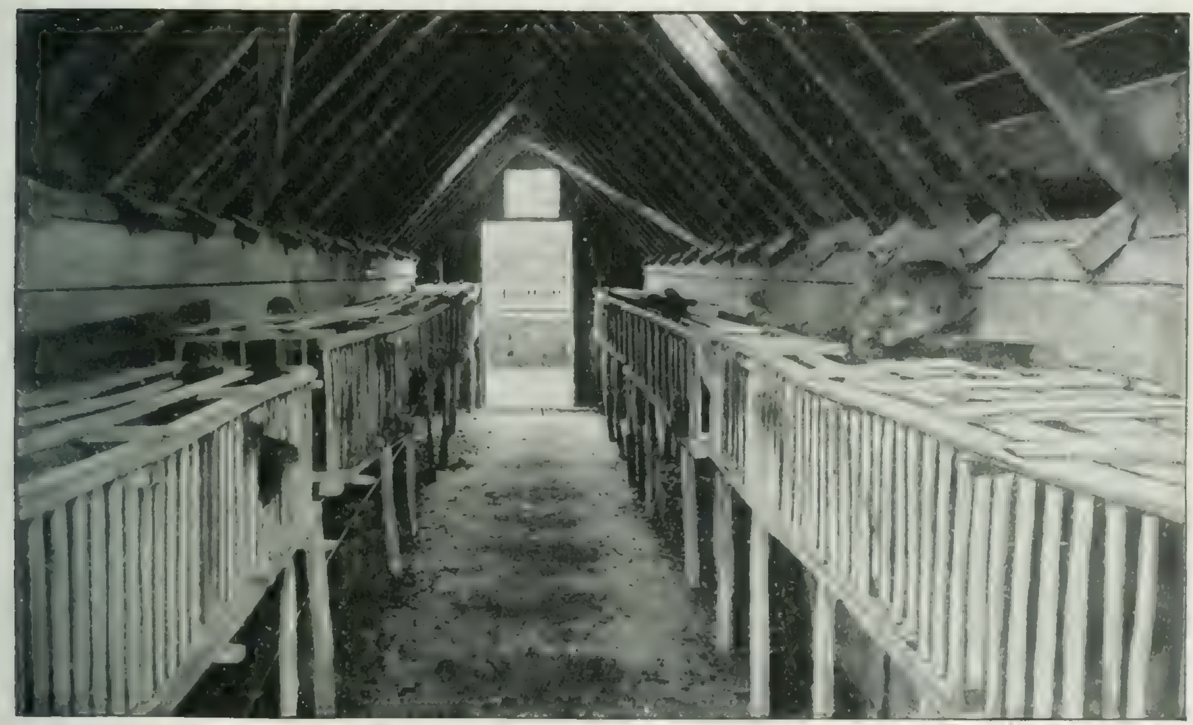
It will be understood that under these circumstances products and prices are not quite uniform. In the district itself meal is chiefly sold by the "quarter" of two sacks. Taking for illustration the two mills just mentioned, in the Buxted mill, turning out very fine meal, ground pure, they were grinding oats weighing 39 lbs. per bushel, while the meal weighed 32 lbs. per bushel (or was at least weighed out as 32 lbs. for a bushel) and was sold (September, 1900) at 18s. per quarter of eight bushels, or 256 lbs. At the Heathfield mill, producing meal rather coarser in grain as preferred in that district, with the slight mixture of barley, they were grinding 40 lbs. American oats, and selling the meal at 30 lbs. per bushel, for 16s. to 17s. per quarter of 240 lbs. Prices would of course vary at both mills according to the market.

Choice of Meal and Fat.

Of the mixture described by Mr. Brown above, of oats with barley and maize, a great deal is also ground and used in Sussex, and we were at much pains to ascertain the comparative results. Our opinion was decided, at the end, that as compared with ground oats, the mixed meal *does not pay*, in spite of its lower price. We found this the opinion of almost all the moderately small fatters, who combined intelligence with *personal* knowledge of the details of their own business: they "could do better" with the pure oats, or what passes for pure (for all agreed that the very small portion of barley mentioned above was quite as good if not better). But we also made personal comparisons. These were necessarily based upon "carrying in the eye" a certain size or class of chicken, since we could not ask busy men to weigh birds for us. But doing this as well as we could, we came to the conclusion that in whiteness of aspect and more even laying on of flesh, as distinct from deposits of fat, the birds fed on "pure" oats were worth about 3d. more than similar birds fed on "fattening meal," and this was also the opinion of the class of men described. Now the cheaper meal certainly does not save 3d. in the three weeks of pen-feeding; hence there seems a loss rather than a saving from its use.

The same applies to the fat used, about which the best fatters are particular. Some buy and render down whatever they can get cheapest from the butchers or elsewhere. But such as pride themselves on the high class of their birds, buy "mutton cauls" and other parts which render into clear mutton suet, or if that fails, purchase Australian tallow, which was first introduced into Sussex practice by Mr. Kenward, and is also of course mutton fat. This fat is whiter, and makes whiter flesh and skin. It is best melted and thrown into cold water, which reduces it to a "pin-head" condition in which it is easily mixed with the meal.

We were told by some that we should find sugar now used in feeding. We only came across a very few feeders who had tried it for a short time; but all had given it up again, for the simple reason that the sweet taste cloyed the birds, and put them off their feeding. This might have been expected.



Sussex Cramming Shed. (Mr. Curd's Farm, Buxted.)

[illegible]

Question of Sour Milk.

The question of sour milk or sweet is no open one in Sussex, and it is strange to observe how some who presume to teach on this subject, decry or sneer at a factor which lies at the very foundation of the industry, next in importance to ground oats alone. The fact that sour milk is used wherever there is an industry which uses milk at all, may weigh nothing with people of this oracular stamp; but it determines the question. There is, however, of course real dietetic reason for such a fact, and it is simply this: the sour milk keeps the digestive organs in proper activity, without the use of fresh vegetables, which would otherwise be necessary. Tell a Sussex fatter to use "boiled milk," and the green food which would then be required, and see what he would say! It is true that the odour can be detected in the manure; but it is not correct to speak of a "stench" as thus caused, and the droppings should be, and generally are, perfectly firm and healthy. The same good results cannot be obtained without an adequate supply of sour skim milk; and in several sheds we visited where there was little odour, and we remarked that they did not seem to be using much milk there, the reply was at once made, that unfortunately milk had indeed been very short that year owing to want of keep for the cows, and that their business had suffered perceptibly in consequence. No attempt is made to check the sourness, but rather the contrary. At one of Mr. C. E. Brooke's farms at Baynards, we found a very large iron tank covered with loose boards, into which all the skim milk was poured as received, and dipped out as required, being kept "going" in this way for weeks together without emptying. We found the same plan on a smaller scale elsewhere. The contents go into a sort of curds and whey, which is well stirred up together before being dipped out for use; after which the covering is replaced to keep out dirt, rain, or sun.

The dietetic effect is illustrated by some experiments in feeding reported by the Hon. A. H. Cathcart, who is himself rather prejudiced against sour milk. He fed a certain number of birds on Neve's fattening meal as used in Sussex, and others on a mixture of sharps, oatmeal, barley-meal, and chopped hay made from tender grass alone, steamed for twelve hours. He found the chickens fed on this made more growth than those fed on the Neve's meal, at a much less cost. He used the skim milk fresh, and found that sour milk "scoured" them. It naturally would do so, being here given in addition to laxative vegetable food; but the Sussex fatters use it instead, and unless a bird goes wrong occasionally, so used it does not scour. The experiment is certainly interesting and suggestive, but it is doubtful if food mixed with chopped hay could be fed by a machine. We found, however, in many sheds, that the consistency of the food was rather thicker than described in the article above, more resembling what we should describe as rather thin porridge.

Pressing Troughs.

The two illustrations, reproduced from actual photographs, of a cramming-shed and out-door feeding cages, taken from different farms, will illustrate what has been said by Mr. Brown above, in regard to the rough and cheap character of the cages, and also give a good idea of many establishments themselves. Remark was also made in the article upon two patterns of pressing troughs which may be seen, as shown in A and B, Fig. 67. A is by far the more generally used in Sussex, while B is often seen at demonstrations in London, and has been undoubtedly copied from presses supplied by the Baynards establishment, and with the idea that it was supported by his authority. We asked Mr. Brooke about this matter, and he told us that the first being made with the vertical back was purely accidental, but it had somehow got copied on his place, and thence by others; but that he considered, if the question was put to him, that A was undoubtedly the correct form. He, however, thought the modern improvement of an interval between the two boards, as shown in the figure, of some real importance, such a trough being better cleaned. Over the backs a very thin board is used, which when loaded with bricks on the top, bends somewhat to accommodate slight differences in size. One mistake we often found was the use of a board too narrow, when the edge of the board makes quite a dent or nick in the back, which if pronounced will make a difference of 3d. in the selling price of the bird. As we pointed out to several, this is quite avoided by using a rather broader board.

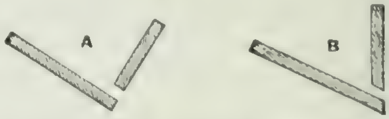


Fig. 67.—Pressing Troughs.

Feathers.

We found considerably more difference than we expected in the return realised for feathers. Some small fatters dig all in or mix it with the manure, and very many use the quills and larger feathers in this manner, but those who have enough sell the body feathers, which must be kept separate for sale. The lowest price quoted to us was 2¼d. per lb., but, as was pointed out to us, this was in September, when they are more brittle and sell worst of all. Several in a fairly large way made 3d. per lb. for their body feathers, and the highest return we found was from a "gentleman" farmer, who got 4d. per lb. for his body feathers, and 2d. even for his quills; but these last he explained to be bought from him for one special purpose whose demands were fully satisfied, and further market for them could not be expected. What was of interest in these last details, was the fact that a man to whom small economies were probably less important than to many, got a better market for this by-product by superior energy and intelligence. These prices are for average coloured feathers. Very dark or black ones are worth much less, and assorted light ones rather more, while white ones kept apart fetch double, or more. This appears one reason why some Sussex breeders, as already intimated, have shown a little preference for white fowls, besides the fact that a white-feathered one plucks to a much nicer-looking skin, and shows pin-feather much less. The receipts from feathers did not, however, come to as much as we expected. Mr. Rew gives a whole year's detailed account of a 200 acre farm which sent over 10,000 birds to market and spent £250 on labour; and the feathers only amount to £14 in the receipts. They were sold at 2½d., and except that 3d. per lb. would rather increase the amount, it seemed fairly representative of what was generally realised in proportion.

We interviewed a very large firm of feather merchants and dressers, who repeated almost exactly what Mr. Brown has said above, but added a few points which are of interest. The minimum quantity they ever purchased was 1 cwt., and this rule they said was general. The chief thing wanted in England was more cleanliness, and more thorough *drying-out* of the grease in the shafts before selling. Actually raw feathers they now refused themselves, and such as took them paid a lower price. Proper drying and care would make on any lot a difference of 20 per cent. in what they would fetch. In their factory the feathers as received are placed in a large tank of chemical solution and thoroughly washed, thence when drained from the water in a receptacle of perforated metal, which is whirled round at a high velocity and thus dries them, the drying being finished in revolving steam-heated drums. When thus perfectly dried, they are whirled round again somewhat as at first, to drive out the dust and re-curl them, after which they are sorted out and mixed for sale, an air blast from the last machine doing the first stage of sorting automatically, as it carries different feathers to different distances.

Home-cured Feathers.

Feathers may be home-cured in a smaller way with considerable success, and it may be useful to many to describe the best method. They should be kept for a certain time to dry; then the quills and coarse feathers must be all picked out, and the feathers steeped in a large tub of lime-water decanted clear from a mixture of about 1 lb. of quicklime per gallon of water. They should be well stirred about several times in this, and left to steep for two or three days. Take off all impurities first from the surface of the liquid, and then take out the feathers and drain them upon large sieves or on a *clean* wire frame like a mason's riddle; then pass them through several waters, the first of which should be hot, in the same way. Finally dry them, first partially upon the wire, and afterwards strewn out more thinly upon twine netting stretched flat at a fair height in a warm room; tap this netting every now and then with a stick, and the dried ones will flutter through to the floor. This sort of *separation* of the individual feathers as they dry, and thorough drying, after the first chemical treatment, are the important details.

Flesh versus Fat.

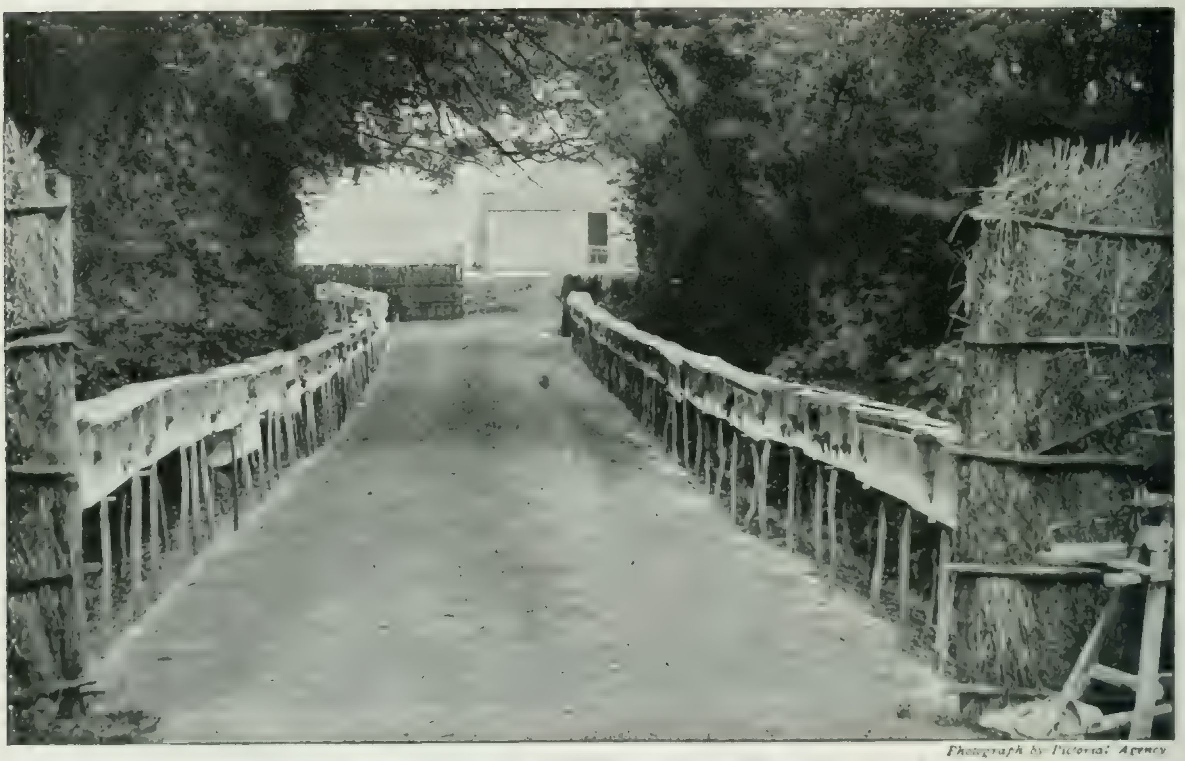
We found a good many fatters, even in Sussex, who seemed insufficiently acquainted with what may be called the practical science of feeding. Most knew better, but some seemed to endeavour to get as much food as possible through the birds, so long as the latter could stand it or did not go wrong. The result of this is, that when a bird so fed is trussed a great deal of internal fat is found, as well as deposits of mere fat under the skin. The mixed meal is far worse than the "pure" oats in this way, but even with ground oats, only a certain amount can be converted into flesh, which is the great object—flesh evenly infiltrated with fat—and any surplus can only form fat. This makes the bird heavy in hand, but in the end the sender gradually loses reputation for "quality," and his price suffers. This matter of even flesh and feeding is connected with that of the open-air pens, which so many writers have deemed questionable. Some of the Sussex fatters have made experiments on the subject; for as a class they are wonderfully keen and intelligent men, by no means slow to take in ideas or to test them. It was a real treat to us discussing points with some of them, and to find what a high type of industrious and often Christian families, both as regards parents and children, this industry had created and maintained. They have tried in-doors for the early stage, many of them, and the uniform verdict is that in spite of the greater exposure, the out-door pens answer better, unless a shed overhead is open nearly all round. Some of these out-door pens are really picturesque, as in the illustration on next page of those belonging to Mr. D. Taylor, Croxted Farm, Framfield. The fact appears to be that during the earlier stages especially, it is above all things needful to have vigorous appetite and digestion; and the fresher air, wider outlook, and consequent greater activity, tend to this, especially in spring and summer, and the birds lay on more flesh and less fat in proportion. The shelter is, however, pretty effectual, as can be seen, against wind or driving rain, and in really bad weather is supplemented over the pens.

In regard to cleansing the troughs used in front of these pens, one well-known fatter had a curious plan, which may be usefully suggestive. Extra troughs being provided, those not in use were thrown into one or other of the ponds on the farm, there to lie in soak for several days. The same ponds contained gold and silver fish; and owing probably to the amount of food thus insensibly added, the fish had swarmed to a great extent, but it was singular that many of the young fish had lost most of their colour. This seems to us another curious example, in a quite different direction, of the effect of ground oats in whitening the skin.

Profit or Loss in Fattening.

Another side of the feeding problem is raised by considering the gains in weight during successive weeks of fattening; coupled with the fact that birds may be brought to the utmost pitch of perfection at a *pecuniary loss.* There is not the slightest doubt that many of the birds which take prizes at shows of dead poultry, such as Smithfield, have been prepared at a loss as regards any possible *market* price, though they may pay for purposes of competition. Such a fact, as we must show, has a very important bearing upon advice as to the best breeds and crosses. Both points may find illustration in further figures regarding the same twenty-four fowls fatted by Mr. C. E. Brooke (which were his exhibits at the Dairy Show of 1894) already referred to by Mr. E. Brown on p. 109. The average weight of all when put up to fatten was 4 lbs. 15½ ozs., and the weight gained during successive weeks was as follows:—

	Entire 24 Birds.		Average Each.	
	lbs.	ozs.	lbs.	ozs.
During first week ...	11	4	0	9¼
During second week	32	11	1	5¼
During third week	8	14	0	5½
During fourth week	2	6½	0	1½
Total gain	57	3½	2	6



Photograph by Pictorial Agency

Out-door Pens in Sussex. (Mr. D. Taylor, Croxted Farm, Framfield.)

After the second week, it can be observed that the increase rapidly falls off, and that the fourth week added scarcely anything—only 1½ ozs. per bird. If fowls could be sold merely by weight, therefore, they would pay better if killed after the fortnight; but the further feeding, though it adds less, rounds out and finishes off the whole bird, and thus makes a share of the price by giving higher "quality." These particular fowls, however, cost 2s. each to feed for the four weeks, in food only, besides the labour; and it is clear that at this cost the 2 lbs. 6 ozs. of flesh and fat added in four weeks could not possibly *pay*, except at the extra price of prize birds at a London show. This is also shown by some experiments recorded by the Hon. A. H. Cathcart. Out of thirty-two birds he put up to fatten, two failed, and were discarded; of the remainder, six made in three weeks a gain in weight of 15.7 per cent., eleven of 31.6 per cent., and the rest, thirteen, of 50 per cent. It is manifest that these last must pay much the best. He also, as others have done, notices the fact that the first two weeks give the best results in weight, but considers that the last week adds a penny or more per lb. to the value of the fowl in "quality."

It is by these market considerations that the real value of breeds and crosses is to be determined, where regular profit is the object in view, and not by winners prepared, often utterly regardless of expense, for a competitive class. Mr. C. E. Brooke, whose long study of this subject is well known, kindly prepared for us, from the books of his firm, the following table showing the cost in different months for lean chickens of various grades, and the average prices realised in London, also for various grades, in 1899. The figures show some of those temporary fluctuations in price for which no very definite reason can afterwards be given; but on the whole afford, in spite of these, a good general view of the average trade that is done. A feature interesting to many will be the prices obtainable for old hens alive; another is the rather low market for what the great commission dealers term "small stuff."

The very narrow margin in the Lincolnshire birds known as "Bostons" is owing to the fact that these are simply well-reared chickens merely fed in a pen for a week or so, but not crammed or shaped like the Sussex birds. Essex birds mostly come as they are, and we have seen many which would have added sixpence to their value merely by one week's good feeding in a cage.

Choice of Breeds for Table Poultry.

The table further gives an idea of the close margin which feeders now have in regard to a large portion of their business, and also of the seasonal changes in the market. These are important. In spring, chickens need not be very large to realise a good price, provided they are well and evenly fed, and nicely prepared; but people who will pay highly for this class, at this season, are limited in number. As the year advances, birds must be larger to realise the same figures, but at this lower price per pound of meat there is a larger market; another class of purchasers will now afford good poultry, and their requirement of *quantity* for their money has to be studied. It is from such practical £ s. d. points of view that we have to consider what are suitable breeds and crosses, concerning which the advice of a certain class of writers has caused so much loss to some engaging in the industry, that it is necessary in a practical work like this to make the matter clear. The most prominent representative of this theoretical school is, perhaps, Mr. Tegetmeier, who practically recommends only the old Surrey fowl (which is indeed admirable for all times of year, if it can only be had!) and crosses of Dorking with Game or Indian Game. He specifically "cautions farmers" against Brahmas or Langshans, and of such crosses says (*Journal* R.A.S.): "It is quite true that size can be gained in this manner, but as the cross-bred birds are deficient in the amount of flesh on the breast, and carry

Approximate Cost of Lean Chickens for Fattening, 1909.

	Jan.		Feb.		March.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.	
	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S	L.	S.	L.
Best Sussex sorts Good ,, locally reared	2/-	2/9	2/-	2/9	2/-	3/-	2/-	3/-	2/3	3/-	2/3	2/9	2/-	2/6	1/9	2/6	2/-	2/6	2/-	2/6	2/-	2/6	2/6	2/9
Boston and Cambridge	2/-	3/-	2/-	3/-	2/-	3/-	2/-	2/9	2/-	3/-	2/-	3/-	2/-	2/9	2/-	2/6	1/9	2/6	1/9	2/6	2/-	2/6	2/3	3/-
Irish	1/6	2/6	1/6	2/6	1/6	2/6	1/8	2/6	1/8	2/9	1/8	2/6	1/6	2/-	1/3	2/-	1/3	2/-	1/4	2/-	1/6	2/-	2/-	2/9
Welsh	1/6	2/6	1/6	2/6	1/6	2/9	1/9	2/9	1/9	3/-	2/-	3/-	1/6	2/6	1/6	2/6	1/6	2/6	1/6	2/6	1/6	2/6	1/9	3/-

Prices of Poultry in Central and Leadenhall Markets, 1909.

	S.	L.	S.	L.	S.	L	S	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.	S.	L.
Best Sussex, Fatted ...	3/-	4/6	3/-	4/6	3/-	4/6	3/3	4/6	3/-	4/6	3/-	4/6	3/-	4/-	2/6	3/6	2/9	3/6	3/-	4/-	2/9	3/9	3/3	4/6
,, very large, or Capons	5/-	7/-	5/-	6/6	5/-	6/6	4/9	5/9	4/9	5/6	4/9	6/-	4/3	4/9	3/9	4/6	4/-	5/-	4/6	5/6	4/-	5/-	4/9	6/-
Boston and Cambridge	2/6	3/6	2/6	3/6	2/6	4/-	2/6	4/-	2/6	4/-	2/6	3/9	2/9	3/6	2/-	3/6	1/9	3/3	1/9	3/3	2/3	3/3	2/9	4/-
Essex	2/-	3/9	2/-	3/6	2/6	3/6	2/3	3/9	2/3	3/9	2/-	3/6	2/-	3/6	1/9	3/-	2/-	3/3	2/-	3/-	2/-	3/-	2/6	4/6
Irish	1/6	3/-	2/-	3/6	2/-	3/6	2/-	3/6	2/3	3/6	2/-	3/3	1/9	3/-	1/6	2/6	1/6	2/9	1/6	2/9	1/6	2/6	2/6	4/-
Last year Hens, alive...	1/6	2/3	1/9	2/6	2/-	3/-	2/-	2/9	1/9	2/6	1/6	2/6	1/6	2/3	1/6	2/-	1/6	2/3	1/6	2/3	1/6	2/-	1/9	2/3
Russian Fowls... ...	1/3	2/-	1/3	2/-	1/6	2/3	1/9	2/6	1/9	2/6	1/9	2/5	—		—		—		—		—		—	
Canadian	From		10d.		to	1/-	per		lb.		—		—		—		—		—		—		—	
West Australian ...	—		do.		do.		do.		—		—		—		—		—		—		—		—	
English Geese	—		—		—		—		—		—		—		5/6	6/6	5/-	7/-	5/-	6/-	—		—	
,, Ducks	2/6	3/6	2/6	3/6	2/6	3/9	2/6	4/6	3/-	5/-	2/3	3/6	2/3	3/6	2/-	3/-	2/3	3/-	2/3	3/-	2/3	3/6	2/6	4/6
Turkeys...	10d. to		1/- lb.		—		—		—		—		—		—			10d	to	1/-	lb.		10d.-1/6 lb.	

S, Small. L, Large.

a great deal of offal in the shape of heavy, coarse bones and useless feathers, the proceeding is not desirable. Crosses of this kind have found no favour in the eyes of our practical neighbours, the French, nor are the birds appreciated by the feeders who buy for the purpose of fattening fowls for the market." Of Plymouth Rocks, it is similarly stated that they are "not adapted for market fowl in England," and of Wyandottes, that "they are, as might have been expected, destitute of any merit as market fowls." When we proceed to test such statements, practically, by either the experience of the "feeders," or by the practice of "the French," or finally by the results at good shows of dead poultry, it will be found rather difficult to compress a greater number of errors within so few lines.

Taking first the feeders, the extremely small proportion of the old Surrey breed has already been referred to, though that is not from choice, but from necessity: also the curious fact that the cross of Indian Game and Dorking has been tried by them, and not approved for the bulk of their business. It is admitted to make the very finest specimens at a certain cost, if a certain price can be reached; but it does not meet the greater part of the figures above, or pay at the size the feeder chiefly wants: it needs age and size to show profitably, and does best late in the year. Their own present local breed, as already stated, has a strong Cochin infusion, shown by fluff and feathered shanks; and the rest are chiefly Brahma or Plymouth Rock crosses. The first is specially liked by a large number, who say it "pays" in their particular connection better than any other. Mr. Kenward, who raised and fattened 8,000 of his own birds, preferred the Dorking and Brahma cross to any other, as making most money, and told us personally that some of his birds realised 7s. 6d. each, about the top price of the London market. These birds are not at all deficient in breast, but on the contrary specially good in that respect, as good Brahma crosses generally are.

French practice is to the same effect. The bird most in favour with French feeders of the present day, the Faverolles, is a combination of the Houdan with the Dorking and the Brahma —two English components to one French! This cross-bred bird has now nearly displaced the Houdan in the Houdan district itself; and we thus see that in actual fact a cross of this kind, so far from finding no favour as alleged, is amongst "our practical neighbours" their last and favourite production. And at some Smithfield exhibitions the Faverolles displayed were considered by all the poulterers, without exception, about the best birds at the show.

Results in Competition.

The same conclusion is enforced by the prices realised at the Smithfield shows of dead table poultry: observe, we say by the prices, rather than the prizes, prices being the real criterion of the professional fatter. Passing a few of the earliest years as possibly questionable on the ground of "ignorance" (which has, indeed, been alleged against their results), we take as the first the year 1894, in which it was known the Duke of York would enter birds, and there was accordingly heavy competition. The Royal entries should be omitted, as realising obviously "royal" prices; of the remainder, the highest price for a pair of fowls was realised by Lady Rothschild's Brahma-Dorking cockerels, weighing 16 lbs. 14 ozs., entered at 15s. the couple, and fetching at auction 30s., while the cup pair of Indian Game and Dorking cockerels weighed 12 lbs. 10 ozs., and realised 27s. This was the more remarkable because the 1894 show was dominated by the theorists here in view, to the extent that there was only one class in each sex for *all* cross-breds beside those Game and Dorkings and "Surreys" favoured by them, and only one each for all other pure breeds, the winning pullets in the latter being Wyandottes, entered at 12s. and realising 18s. On the other hand, what is said above about the very highest quality and occasional special prices, was borne out by the Earl of Yarborough's six-group of the Indian Game and Dorking cross, which was bought by Mr. W. Bellamy for the Constitutional Club for six guineas; this group weighed 55 lbs. 14 ozs., averaging 9 lbs. 5 ozs. each, at an average price of 2s. 3d. per lb. We notice these particularly because the prices approximated to French prices, and the fowls accordingly fully equalled French fowls. For years past French feeders have had nothing to teach English, so far as anything like such prices can be obtained; but it is not reasonable to expect a bird sold for 5s. to equal a French one sold for 20s.

In 1895 the highest of the Dorking cockerels realised 15s., pullets 13s.; the English Game cockerels 18s.; Indian Game 11s.; and pullets 10s. 6d. Again there was one class only in each sex for *all* other pure breeds, Langshans winning in each, and realising 13s. and 13s. 6d. Of crosses, top prices were in Game Dorkings, 14s. and 15s.; Indian Game ditto, 18s. 6d. (very large) and 14s., while in the one class each for all other crosses, two pairs of Dorking and Brahma cockerels realised 16s. and 15s., and the best pullets 14s. We have no notes of 1896, but by 1897 the merits of other breeds had made themselves felt, and competition in all was stronger, with high prices as the result all round. In Dorkings, pairs of cockerels fetched 21s., pullets 23s. and 16s.; English Game cockerels 14s., pullets 24s. and 16s.; Langshans (one class) 18s. and 15s., both pullets; Orpingtons (one class) 40s. and 16s. (cockerels); Rocks (one class) 19s. (these were pullets from a Sussex feeder, Mr. Kenward of Waldron). In the crosses, Game Dorkings fetched 21s. (two pairs); Indian and Dorking, 18s. (two pairs) for cockerels, and 27s. pullets; the class for all others, 23s. in cockerels for Indian and Langshan, 15s. in pullets for same cross, and another 15s. for Indian and Sussex.

In 1898 there was again strong competition, and we append the results in fuller tabular form, which show some interesting variations, though the main conclusions remain as before. Pure Dorkings beat all other pure breeds both in highest price and average; next come Langshans in highest price and Plymouth Rocks in average. Again the competition value of the Indian Game cross is manifest in higher prices, but it also gives nearly the lowest price; and the winners and most of the others in Surrey and Sussex fowls had feathered legs.

	Weight of First Prize, except as stated.	Price of First Prize, or other as stated.	Lowest Price realised in Class.	Average Sale Price of Whole Class.
Dorking cockerels	16 lbs. 12 ozs.	22/–	7 –	10 7½
pullets	15 lbs. 6 ozs.	22/–	7/6	10/6
O. E. Game, either sex ...	10 lbs. 14 ozs.	10 –	6/–	8 11
Indian Game, either sex ...	17 lbs.	13/–	7/6	9 6
Langshans, either sex ...	19 lbs. 2 ozs.	13 6	5/6	9/–½
(second prize)	21 lbs. 8 ozs.	13/–		
Orpingtons	14 lbs. 8 ozs.	10/–	7/-	8/7
(No. 103, v. h. c.)		13/–		
Plymouth Rock	14 lbs. 12 ozs.	12/–	8/–	10/6
(third)	17 lbs. 4 ozs.	13 –		
Wyandotte	14 lbs. 2 ozs.	11,6	8/–	9/2¼
(third)	16 lbs.	11/6		
Any other Breed:				
Lincolnshire Buff ...	15 lbs. 6 ozs.	13 –		
Faverolles	13 lbs. 2 ozs.	9/–		
Cross Breeds:				
O. E. Game–Dorking ...	15 lbs.	13 6	8,6	9/8
Indian Game–Dorking				
cockerels	20 lbs. 12 ozs.	21/–	6/6	9/–
pullets...	13 lbs. 14 ozs.	16/–	6/6	9 10
Any other Cross cockerels	16 lbs. 14 ozs.	15/–	7/–	9 3
pullets...	15 lbs. 8 ozs.	15/–	7/–	8/11
Surrey or Sussex cockerels	20 lbs. 4 ozs.	16/–	7/–	9/2
pullets ...	14 lbs. 6 ozs.	11/–	6/–	7 10

In 1899 the prize birds were not sold by auction but left to be claimed, only the residue being sold at the close. The results were not different, quality being high all round. Dorking cockerels realised 16s. per couple and pullets 12s.; English Game, 12s. (cockerels); Indian Game 15s. (two pairs, both cockerels); Langshans, 16s. (three pairs) and 15s. (two pairs); Black Orpingtons, 16s. and 15s. (cockerels); Buffs, 15s. (two pairs); Plymouth Rocks, 15s. (two pairs); Wyandottes, 15s.; any other breed, 14s. and 12s. 6d. for Faverolles, which would undoubtedly have fetched more. In the crosses, Game and Dorkings made 18s. and 15s.; Indian and Dorking, 24s. for cockerels, and 18s. pullets; any other cross, 24s. in cockerels for Sussex-Dorking; 16s. in pullets for Indian-Langshans; Surrey or Sussex 20s. and 18s. for cockerels, 18s. and 15s. pullets, nearly all these being more or less feather-legged, according to what we have said before.

Practical Selection.

Later figures than these are unnecessary for the intelligent rearer and fatter, and he will learn from such facts and the table on p. 137 to select his birds according to the size, price, and market he is working for, and his own circumstances and experience. Such shows as have been cited have done, perhaps, as much good in promoting greater freedom in this respect, as in teaching the public what good poultry is, and the cash value of it; and it should be more generally known than it appears to be that the Worshipful Company of Poulterers offer their gold and silver medals to any County exhibition of dead poultry which comprises not less than fifty exhibits, from which one month's notice and application has been sent to the Clerk of the Company. We have been informed by several poulterers and salesmen in the wholesale London markets that the former prejudice against both black legs, and yellow legs and skin, has largely disappeared, though not entirely, but that white legs and skin still have real value. It is remarkable that in America the yellow skin and leg are actually preferred; and most people who have made direct comparison at the same meal have admitted that there is a certain kind of moist juiciness in the meat of many yellow birds, which does not as a rule exist in the white breeds. The flesh of the latter is typified in perfection by that of the pheasant, or in fowls of the Dorking, both of which many people think rather short and dry, though very superior in other respects. This is the probable explanation of a theory held by nearly all Belgian feeders, that the best results in table poultry are obtained by crossing a yellow race upon a white-fleshed race, which is singularly borne out by the Indian Game or Brahma cross upon the Dorking; by the Buff Orpington or Lincolnshire Buff, which has taken the Buff Cochin into indigenous white-skinned stock; and by the Faverolles, which is admitted by the French to surpass the original Houdan.

Neither can any given breed or cross be relied upon, merely as such, to produce good table fowls. Individual birds or strains of the same breed differ greatly in their table quality, and need to be carefully chosen in reference to this. The flesh of the modern type of Langshans may be excellent, but the immense length of limb makes the trussed bird look repulsive. Many Dorkings are short in the breast-bone and coarse in skin, while others are long in body and fine. Many modern Brahmas, since these have been bred to the Cochin model, are unfit for crossing, while others may be found which produce admirable table fowls, having splendid breasts and thin pinky skins. The modern breeds of Wyandottes, Rocks, and Orpingtons differ amazingly in their conformation and table qualities; and so do Indian Game as regards their length and size of limb, and their effect in producing white or yellow birds, a question which still has a money value. One Indian Game cock will throw chiefly white skin with Dorking hens, and another yellow; and one strain of Dorkings will do the first, and another the second, with the same Indian mate.

The practical breeder will study these things more than the precise cross, but chiefly of all keep in view skin, breast, and bone. A thick coarse skin, or which looks coarse from pin-feather, means an appreciable amount off the value of a bird equal in all other respects. Objection to "bone" has been carried by some to a ridiculous extent; yet too massive shanks also depreciate a fowl. But the chief thing of all is breast. This must be broad, that from a large fowl slices may be cut: this point is judged from the front of the live bird, and is most generally wanting in Langshans, and some other Asiatics. The breast should also be deep, so that the slices may be large ones. This is judged from the side, which should resemble roughly a parallelogram with the corners rounded, as in a good Dorking, or a fir-cone tapering from shoulders to the rear, as in good Game; and this point is most apt to fail in Brahmas, Langshans, Rocks, and Wyandottes. And the breast should be long, that the whole carcase may be so, and carry much meat; this is best judged by feeling the actual keel of the bone. Many turkeys fail here lamentably, and so do many Dorkings, Brahmas, and even some Indian Game; but any student of the Smithfield shows, or of fowls and their prices at a first-class West-end poulterer's, will soon see that, supposing good colour and finish, this point of *length of carcase* is perhaps of all others most important in determining the apparent size and value of a fowl. Of all the races used, birds can be found good in all these respects, quite independently of their feather points, which are of no table value; from such the intelligent rearer will make his selections.

Almost equal differences will be found between strains and individuals of all breeds and crosses as regards early maturity, and aptitude to lay on flesh in response to food. Nothing is more vital to the question of profit than this, as exemplified in Mr. Cathcart's results cited on page 137; and it has been found that chickens reared upon ground oats do much better upon this food when fattening, than those reared upon grain. The rearer who breeds his own stock will proceed upon his own knowledge and experience in regard to these points; in regard to purchases he must rely upon either observation or inquiry: if he knows the real age of a bird, he will be able to judge pretty well about its rate of growth and condition. Just as in breeding for egg-laying, the intelligent development of such practical qualities is vital to success, in face of the growing competition from abroad and the extension of poultry-rearing at home, and the effects of both upon a market which has its limits, and may be affected by greater production like any other.

Opening-up of New Markets.

That the market has been affected to some extent already has been shown above, and is sufficiently evident. The greatest opening for successful effort lies in that *education of the public* to appreciate and pay for better poultry, which Mr. Brown has referred to on page 110. It is doubtful if the London market can take much greater supplies at present prices, and we have seen that a perceptible portion of the Sussex product is already going into local markets. Here there is room for expansion. There are large districts, and even towns, where only low-priced common poultry are as yet practically known. The Hon. A. H. Cathcart[*] reported in 1899 that 1s. 6d. was the lowest and 2s. 6d. the highest price for a fowl in any market in East Yorkshire, while at York itself 3s. was thought high, and any more simply exorbitant. Yet by experience people in York had been taught to pay him 5s. each for larger fatted birds, and educated to understand that they were thus actually paying *less per pound* for actual flesh, and that of much better quality. This arises from the fact that the bone and offal grow comparatively little in the few weeks of fattening, and that the weight added is nearly all to the *edible* portion of the bird. This has already been illustrated by figures from two English feeders; it may be further so, perhaps

[*] *Journal of the Royal Agricultural Society.*

more clearly, by some experiments made in Canada by Prof. Robertson. He bought ordinary chickens in the Ottawa market, of which three fair representatives were killed as they were, and weighed as plucked; as trussed for cooking; after cooking; and finally the weight taken of the bones and carcase left, the rest reckoning as edible meat. The same was done with three similar chickens fed up for 36 days, and the following were the results; the weights being that of the whole lot of three each:—

	Weight before Fattening.		Weight after Fattening.	
	lbs.	ozs.	lbs.	ozs.
With feathers off	8	8	16	4
Ready for cooking	5	2	11	6
After being cooked two days	3	8	9	2
Bones	1	2	1	11
Edible portion	2	6	7	6

It will be seen that while the plucked weight of the fatted ones was barely twice, the weight of edible meat was fully *three* times that of the ordinary birds. Good shows of dead poultry at agricultural and poultry shows, will assist in spreading this sort of knowledge, and may thus open markets in other districts.

It may be possible also to develop *fresh tastes* in poultry. As stated in the article above, there has been very little increase, if any, in the demand for *petits poussins* or "milk chickens," which appear too tender and melting in texture for average English palates, trained mainly on joints instead of the tender stews and *entrées* so universal on the Continent. We have known many experiments in offering such a delicacy to result in the verdict that it was not worth eating, especially at the price: national palate has much to do with matters such as these. But when we consider the immense, apparently unlimited, demand in America for "broilers" of 1½ lbs. to 2½ lbs. in weight, the outlook for such a product as this in England may perhaps be different; and every breeder who, on any possible opportunity, treats a friend or an accidental guest to a broiled chicken, may perhaps be doing something to create a taste and demand for birds of this type. So far we have only come across broiled chicken to any extent upon the upper reaches of the Thames, where it is well known under the name of "sudden death,"* and very popular; and where known elsewhere, it has generally become so through acquaintance with boating men. An active demand for this class of birds would be of great advantage to rearers, as they are marketed earlier, without the risks and critical stages of fattening; and what boating men have already done should encourage rearers to set a similar example, and show what this appetising dish is, on every possible occasion. More or less of the methods employed in their production in America will, no doubt, be adopted should the "broiler" class of chickens ever come into extensive demand; at present the small market in London is chiefly supplied by the smaller class of Irish birds.

Exhibiting and Judging.

Very little need be said about exhibiting table poultry. It is generally stated that the birds are to be shown "trussed but not drawn," but this is misleading, as they are not really trussed at all. They should be shaped in the press, or by cloths, so that the legs and wings lie neatly, close up to the body, in the proper position; and most carefully plucked and stubbed, so that the holes of the feathers may not look coarse; leaving feathers only on the head, and an inch or two down the neck. The shanks should have been washed or wiped if necessary, before pressing; and after setting, the head may be wiped if required. Nothing more is allowed or should be done, beyond tying the hocks together, and the birds are shown on their backs upon a flat or slightly sloping board, with their necks and heads hanging down over the front edge, towards the spectator. Breaking the breast-bone, or any other such expedient as is presently described, is not allowed.

Judging should depend upon fair and proportionate consideration of many points. Size and good matching ought to count for a good deal, and it is nonsense to rail as some do at the alleged fact—never true in a real sense—that they have been "judged by weight." It is simply that size has a value; and the aim of a show should be to teach the feeder to produce, and to encourage the production of, birds of the *most value* to him, and the purchaser, and the public. It is not the business of poultry theorists to artificially encourage, or compel exhibition of, what they are pleased to pronounce superior "quality," but which the public will not pay the same price for. Straightness of breast-bone also counts a great deal in the appearance. That and length of body, well filled up with meat to the top of the keel, have as much as anything to do with the making of a fine table fowl. Breadth, and fullness of the wing, likewise count. Fine and delicate-looking skin must also be considered, and also whiteness of skin and body, though in less degree, for splendid birds have been shown quite yellow in skin. Another quite cardinal point is evenness of flesh, free from deposits of yellow fat clearly visible under the skin: the latter at once stamps the bird as badly fed and coarse. Really good and even feeding shows specially upon the back, which should be well covered with lean meat; so reliable is this sign of good feeding, that in France fowls are often exposed for sale with the back uppermost. If that is well covered with meat the breast is nearly sure to be so; but the converse by no means holds good, so that many English housekeepers do not believe in there being much meat on the back at all. Smallness of bone should have some weight given to it, though not nearly what some insist upon. Finally, there is the quality of the flesh, which can be judged by gentle, delicate touches with the tips of the first two fingers of the right hand.

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* So called because it is usual to go and catch your chicken and chop its head off, letting it bleed while you boil up a pot of water. You dip it in the boiling water, which enables you to pull off the skin with feathers and all; then draw, split, and broil it, with pepper and salt to taste, basting with butter, and putting more butter on the hot bird when served.

Since the previous edition was published the Utility Poultry Club have decided upon the following standard for judging table poultry:—

1. Size and quality	25 points.
2. Youth, quantity, and quality of breast meat ...	30 points.
3. Straightness of keel, fineness of bone, absence of offal and surplus fat	25 points.
4. General marketable appearance, colour of skin, &c.	20 points.

Trussing Fowls.

The feeder or breeder as such has nothing to do with trussing fowls or preparing them for the table. He cannot have, because the least wound would be a centre of decomposition, and the birds he sends must "keep" as long as possible. That is why he fasts them, that they may go to market with both crop and intestines empty. Trussing is the poulterer's business, and is put off till the birds are sold for actual consumption. Of course, now and then a poulterer who is close to his own source of supply may order fowls to be delivered trussed, but this is seldom the case. More often a rearer and feeder in a small way, in a district where a demand for better poultry is growing, may have private customers, and be glad to secure the double profit.

There are various ways of trussing a fowl; the old-fashioned plan with skewers, the liver being tucked into one wing while the gizzard graces the other, being described in most cookery books. A much superior method has, however, been more and more adopted by the best London tradesmen during recent years, and is likely to supersede all others wherever it becomes known. The following description of this method, which has not hitherto been correctly explained, is written from notes of the lectures and demonstrations given during several years in succession at the Dairy and Smithfield London shows of table poultry, by Mr. W. Bellamy, of Jermyn Street, one of the best and probably the largest* of West End poulterers, and by his chief manager (Mr. R. Batchelor).

The first thing is to draw the sinews from the drumsticks. This can be done in two ways. Making a longitudinal incision in either side of the shank with the point of the knife, about an inch above the foot, the end of a skewer is inserted under the sinew, the skewer twisted round it for a purchase, and taking the skewer in the right hand, the sinew is drawn out. The other way is to treat it like a turkey's leg, cutting across the shank in front, just above the foot, down to the bone, and bending the foot further over till the shank-bone breaks; then hooking the bent-down foot into a **V**-shaped hook (an ordinary meat-hook does not answer: the angle of the **V** is required to "jam" and hold the foot firmly), and pulling the limb down, the foot and sinew are left behind. Either now or previously the two points are cut off from each wing, and either all the toes half an inch from the ball of the foot, or some cut off the entire foot, which we think is preferable, even when not done in drawing the sinew. When a fowl is thus prepared at home, all these trimmings should go into the stock-pot along with the liver, gizzard, neck, etc. The sinew above the hock-joint, in front, is also cut across, in order that the shank may "lay out" nicely, instead of doubling up as in the natural position.

Next we take off the head and neck. With the fowl's breast downwards, pinch up the skin at the back of the neck close to the shoulders, insert the point of the knife longitudinally at the side, and cut *upwards* so as to leave a small flap about an inch long. Draw this flap back, and pressing the very top of the breast firmly down to the table, cut through the neck-joint close to the root, or level with the shoulders, leaving no neck-bone projecting. This is to be done, however, without cutting through the skin on the lower or breast side, which is simply scraped fairly clean of flesh and the congealed blood which may have collected. We thus have a small flap an inch beyond the stump of the neck at the back, and a broad flap from the breast or front, which is cut off about three inches long. In trussing up, the back flap is first folded over the stump; then the broad flap, when secured over this, keeps in the juice and the gravy.

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* We are informed that 340,000 fowls alone were bought and sold by Mr. Bellamy during a single year. Independently of the public demonstrations above mentioned, the influence of methods thus widely exemplified is necessarily great.

The crop can now be easily "peeled" away from the surrounding flesh, always commencing from the left side and going round, and is cut off, with the remnant of windpipe, pretty far in. The forefinger of the right hand is then introduced into the cavity, and worked thoroughly round, as deeply as possible, between the viscera and carcase of the bird, loosening everything all round, as far as the finger can reach; upon this depends easy "drawing." The fowl is then held tail upwards on the table, and a cut about half an inch deep made across just under the tail-joint or "parson's nose," and above the vent. The hooked forefinger can now be passed round the lower end of the bowel, and a small loop pulled out; inserting the knife under this, cut upwards, and the vent is cut out without dividing the bowel. The first two fingers of the right hand are then inserted so as to embrace the gizzard, when, if the loosening in front has been properly done, the entire viscera, including intestines, lungs, liver, gizzard, and gall-bladder, are pulled out quite easily in one mass, leaving the interior perfectly clean, and needing neither washing, wiping, nor any further operation whatever.

The merrythought should next be removed, though this is of course optional: if in a family the bird has to be made "go round" as far as possible, and the merrythought is desired for a separate "portion," such a step will of necessity be omitted. Pulling back the skin, the flesh is scraped a little down the front of the two bones, after which the point of the knife will lift each out of its seat without any meat adhering. This gives a much better breast, and in the case of a large fowl, enables good slices to be cut as from a turkey. It is really better to do nothing further to the breast, especially for home consumption; and a well-fed Surrey fowl needs nothing even in the way of appearance, the forcing up of the back and subsequent pressing bringing the meat up well. But many people are so accustomed to the look of fowls whose breast-bones have been smashed down by a rolling-pin, that if an ordinary bird were sent them in its natural state, they would indignantly complain that it had "nothing on it." This can be remedied without smashing the keel itself (which ruins the carving); and however futile it may be, until the public are better educated there is no doubt that a difference of threepence to sixpence in the selling value of the fowl will often be made by treatment. Mr. Bellamy's method is as follows: Either the poultry-knife is inserted through the vent, in the transverse or flat position, and the point driven by a smart tap through the flat of the breast-bone just under the front of the keel, which is held down on the table; or a steel skewer may be inserted from the front at the same point, and given a slight wrench right and left, breaking the thin flat bone in the same way. In either case, a very slight tapping with the flat of the knife afterwards will then drive in the entire breast-bone, without any fracturing of the keel itself, and the look of the breast is much improved. We look forward to the time, however, when even this method shall be discarded.

All is now ready for trussing, for which we require a straight trussing needle eight or ten inches long, threaded with twine. We will first take a fowl for roasting. The bird is laid on its back, with the neck towards the operator, with the first or thigh joint of the legs held down to the table, and the needle with twine is passed straight through both thighs and the body, just above and touching the thigh-bones, and rather nearer the joint than the middle of the bone. The back is then turned uppermost, the pinions turned or twisted inwards so as to point towards each other over the back, and the same twine taken through the wing-bone (*i.e.* the double-bone) near the centre and between the two bones, then through the pinion, thence over the end of the doubled-down breast-flap of skin (now doubled close over the stump of neck and its little flap, on to the back), thence the reverse way through pinion and wing-joint of the other wing (Fig. 68). The twine is then drawn up sufficiently tight and tied; it should not be too tight, or the fowl will not lie firm on the dish, but so that the two wings stand about parallel and square. Threading the needle again, it is next passed just under the bone of the back at the loins or haunches, where there is a small

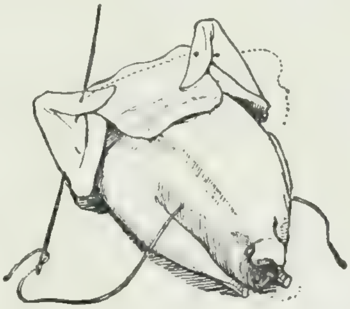


Fig. 68.—Threading of the Wings.

hole on each side apparently designed by Nature for the express purpose, which can readily be seen in any denuded carcase of a fowl. Thence the twine is taken over the end of the drumstick, through the body again, just over or embracing the flat part of the back end of the breast-bone, and over the other drumstick to be tied. The fowl is then finished, as in Fig. 69.

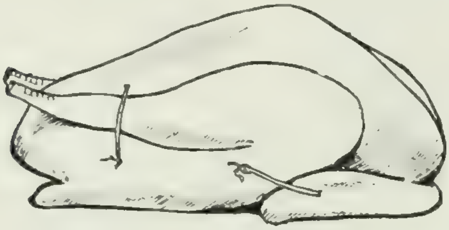


Fig. 69.—Trussed for Roasting.

For boiling the fowl is treated differently. It is beheaded, drawn, and merrythought and sinews removed, as before. The fingers are then introduced through the vent, and the skin loosened or separated from the flesh at the side of the breast, and all round the thighs and drumsticks, down to the hocks. A cross-cut is now made down to the bone, at the back of each drumstick an inch above the hock, and another across the front of the shank an inch and a half below, dividing the sinews. Each foot in turn is then taken, with the bird on its back, and the doubled shank wrenched or twisted *inside* the drumstick, so as to lie rather under the latter instead of above, in which process the joint is heard to crack. The shanks are then doubled in, when it will be found that, by the aid of the cut made above the hock, that joint can be pushed in and the loose skin stretched and coaxed and drawn over the whole, hiding the entire leg from view, the projecting part of the shanks being finally cut off. Female cooks generally prefer to cut the feet off first, pushing in the doubled limb afterwards. It is customary with some also to crack the shoulder-blades, by a smart blow with the back of the knife between the neck and shoulder of the wing on each side, which gives a more rounded shape when the bird is tied together; but this is not necessary. In trussing, the wing- and thigh-joints are secured and tied the same as already described (Fig. 68). The other tie securing the legs may also be made in the same way, being in no way affected by the fact that this joint is now hidden under the skin, but there are several other methods. One is to make a single tie round the entire stern of the fowl: another to pass the needle through the drumsticks and round the back end of the breast through the body, and tie over the back. For that shown in our illustration, the needle with twine is taken through body and drumsticks as just mentioned, the twine then taken and crossed round the knuckles, and pulled well in, and the crossed twine tied over the back, which is a very neat tie. Finally the tail-joint is tucked down into the vent, and the bird is finished as in Fig. 70. While, however, a fowl thus trussed looks nicest on the table when covered with white sauce, some lady housekeepers prefer for carving to dispense with pushing the leg under a skin apron, simply removing the shank at the hock joint, and otherwise trussing exactly as the roasting bird in Fig. 69.

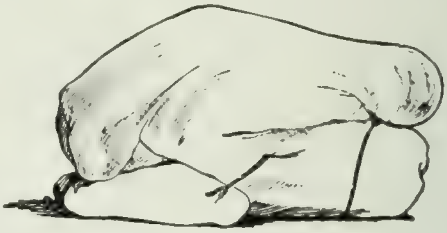


Fig. 70.—Trussed for Boiling.

Poulterers who draw and truss many birds usually sell the livers, which are used for "game" pastes and savouries, at 1s. to 2s. per lb. The necks and other giblets realise but little over ½d. per lb. The intestines are practically valueless, and have sometimes to be paid for to be taken away; occasionally a small fraction is realised for some local purpose.

CHAPTER VIII.

POULTRY FARMING.

THE subject of this chapter is a wide one, which appears to act in a peculiar manner upon some temperaments. The number of people, utterly ignorant of poultry, who believe firmly that a living is to be made by keeping a lot of fowls, and that it is an easy outdoor business anyone can go into and prosper in, and which will exactly suit their health and pocket and disposition, is amazing. At the other extreme are certain writers to whom any mention of poultry-farming, or any advice to farmers to keep poultry more largely and make money by them, seems to act like a red rag before a bull. It is curious also how people of this type always want to insist that poultry-farming, to be called such, must be "pure and simple," as if other farming was anything of the kind. Farming of any sort is of necessity a somewhat complex pursuit, and no one that has ever advised the production of poultry or eggs upon any extended scale—however ignorant or ill-advised he may be—has failed to point out the necessity for some other product in connection therewith, if only to utilise the manure. Certainly, the poultry-fattening described in the previous chapter, when carried on alone, by purchasing birds only to be fed in cages, cannot claim such a name, for where there is no land there can be no "farm." But as soon as we find rearing chickens upon land, in connection with even that, and the manure used, and cereals and milk given to the fowls, and sold through their flesh or eggs rather than direct, there we have more or less of poultry-farming. We shall dismiss all such quibbles by understanding here as "poultry-farming," *land* worked more or less in conjunction with poultry, or poultry kept otherwise than in a small pen; not for health, or occupation, or as a hobby, or to provide a few eggs for only family use, but with the declared object of *making money* by the proceedings, and with no other end in view.

The most obvious phase of this matter is a great extension of the usual amount of poultry upon a farm, and systematic looking after it; but we are told by some that even this is not practicable beyond a very small scale. To quote one well-known writer, "Neither poultry, pheasants, nor turkeys can be reared year after year successfully upon the same ground," and, therefore, "as many fowls can be kept near the homestead of a small 30-acre farm as can be kept on one of 300 or 3,000 acres," as if health in rearing was not entirely a matter of adequate ground to keep healthy, or as if anyone of common sense would keep the poultry stock of a large farm "round the homestead" at all, or otherwise than spread out over his fields. This is the mere dogmatism of ignorance; and not a single case has yet been reported of any farmer who has gone largely into poultry in the manner presently described, having had to cease from tainted ground. The real difficulty is quite different and very simple. Previous pages will have shown that in gross return per bird in proportion to keep, a fowl far surpasses any other live stock. But it has the tremendous drawback that it is a *small* unit: the products have to be realised in numerous small detached items from small animals, which yet require more care than sheep. Hence the constant liability to small losses and wastes, and the difficulty of organising such oversight as shall prevent these, and the expense of such separation as shall keep things in hand. *The great difficulty is that of labour*, and next to that, the cost of accommodation and fencing. Land or rent is no difficulty at all; even if devoted to laying hens at the rate of an acre per hundred, it is not rent that will cause failure: it is a question of egg-product in proportion to the cost of food, labour, and interest on capital.

The Real Difficulty.

But while grass land will maintain well and in health 100 fowls per acre in perpetuity, run upon half of it for half the time, and then upon the other half, a dozen fowls per acre can be run upon a farm *without in any way interfering* with other stock or other purposes; not "round the homestead," of course, but provided they can be distributed over the farm. We stated this fact twenty-six years ago, to be repeatedly derided for the statement; but that same fact is now the commonplace of County Council lecturers all over the kingdom, and scores of farmers are proving it true, to their profit. Horses especially, and cattle only less so, actually *prefer* to graze where such a stock of fowls have most congregated, round their house. This is now an acknowledged and positive truth, and the manure these fowls make on the farm is of the greatest value to the holding, which farmers—slow as they were for years to believe it—are now at last learning for themselves. We are thus brought first of all, therefore, to consider the true agricultural value of this poultry manure.

Real Value of Poultry Manure.

We were the first to place this beyond doubt, by obtaining an analysis from the late Dr. Augustus Voelcker, Chemist to the Royal Agricultural Society, of two different samples representing different conditions. We found by repeated trials that poultry manure, after storing for a few weeks in casks under cover, was reduced by drying to about half its weight. Our birds at that time being kept in pens, the late Mr. O. E. Cresswell sent for us to Dr. Voelcker samples from his Dorkings, kept on grass; both fresh as dropped the night before, and that partially dried by storage. They analysed as follows:—

	Fresh Manure.	Partially Dried Manure.
Moisture	61·63	41·06
* Organic Matter and Ammonia Salts...	20·19	38·19
Tribasic Phosphate of Lime	2·97	5·13
Magnesia, Alkaline Salts, etc. ...	2·63	3·13
Insoluble Siliceous Matter (Sand) ...	12·58	12·49
	100·00	100·00
* Containing Nitrogen	1·71	3·78
Equal to Ammonia	2·09	4·59

There is a fully recognised method of valuing such manures according to the ammonia which they contain, and by this standard Dr. Voelcker valued the fresh moist manure at £2 per ton, and the drier stored sample at £4 4s. per ton. For years these were sneered at as fancy values; but there is no mistake about them, and however slow the conversion has been, they are at last becoming recognised. The manure from fatting-sheds, owing to the nitrogenous food, is of perceptibly higher value. Dr. Voelcker expressly reported upon ordinary droppings as "a much more concentrated fertiliser than the best description of ordinary farm-yard manure."

We have next to consider its quantity, its application, and its results. We found that our Brahmas dropped from 3 ozs. to 4 ozs. per night; while Mr. Cresswell found his Silver Grey Dorkings (on nine days' average) produced slightly over 2 ozs. each per night. This is 46 lbs. per annum, while the Brahmas gave 68 lbs. of moist fresh dung. We thus find that the night manure alone of the largest birds is worth one shilling per annum, while that of smaller breeds may perhaps be taken as half. There is that dropped during the day to be added to this; and we thus found and calculated, so far back as 1881, that every bird on the farm was *worth one shilling per annum in manure alone.* This calculation also is now endorsed by all competent authorities, and by actual experience on scores of farms.

Proper Use of the Manure.

The full value of such manure may, however, be partially lost, and often is, by injudicious treatment. Repeatedly in Sussex we found *lime* used under the pens, as an antiseptic. Nothing could be worse; for lime liberates and thus *loses ammonia*, and Dr. Voelcker expressly cautions against its use. We were not surprised that when so managed, the farmers found it best to "get it on the land as soon as possible," which really meant, before more ammonia was lost. Dr. Voelcker recommends various methods, which may be selected according to circumstances. It may be simply mixed with about twice its own weight of such dry earthy matters as dry earth, burnt clay, or weed ashes, into a compost, occasionally turned over, which may be used for garden produce or green crops. For roots he would prefer it mixed with an equal quantity of super-phosphate of lime, and the mixture, in a dry and powdery state, drilled in with the seed at the rate of 5 cwt. per acre. For sale, he advises that as little earthy matter should be used as will assist in drying it, soot or weed ashes going far and being valuable in this way. But on the whole he advises to keep a mixture of two parts burnt gypsum to one part of mineral super-phosphate, mixing three parts of fresh poultry manure with one part of this mixture, and turning over occasionally under cover. It is thus rapidly reduced to a dry and friable condition, which makes a good manure for most crops when used at the rate of 8 cwt. to 10 cwt. per acre. In Sussex most of it is used directly upon the land, simply scattered broadcast, with admirable results upon most crops, and specially upon poor pastures or scrubby land. Its value for tomatoes has been already alluded to. This fruit does not require a highly nitrogenous manure such as guano, and therefore actually thrives better with poultry manure, which may be either applied in water, or the above mixture with a little super-phosphate further diluted by dry earth, and applied as a mulching to the plants. Grapes may be treated in the same way. As a general rule poultry manure is applied too copiously or freely.

During the last few years very many farmers have been going more and more into poultry-keeping in the way here indicated, distributing the fowls over the farm, and not exceeding the proportion stated, when no rent at all becomes chargeable. Every County Council lecturer to whom we have spoken on the subject has been able to give us successful instances, and we here select a few kindly supplied to us by Mr. George A. Palmer, lecturer to the Councils of several counties in the Midlands of England.

Examples of Poultry on Farms.

Mr. J. Haynes, Rock Farm, Inkberrow, Worcester, has six pens of fowl, containing in all 210 birds, averaging thirty-five to a pen. They have the run of 100 acres, and he has kept the same number or thereabouts for twelve years. The movable houses are taken into the corn-fields after harvest, where the birds get their own living entirely for two months. He thinks that with the universal use of the self-binding reaper, which often means three bushels shed to the acre, it will pay farmers more than formerly to stock the stubbles with fowls. He gets 20,000 to 25,000 eggs per annum, and they are marketed at Birmingham by the local carrier (working on commission). He rears 150 to 200 chickens. The cockerels are sent to market as fast as they get ready, and the old hens are cleared off in September. He considers that the manure covers all labour. He stores it in a shed for the year, and uses it in spring to grow mangolds, with such effect that in 1899 (by no means a good year) he grew about forty tons to the acre. He uses dry ashes in the fowl pens, and keeps them lime-washed, and for twelve years has been free from any disease. In 1899 he had a splendid lot of pullets, Leghorn crossed with Wyandotte (whites both), which commenced laying in November, and on February 1st following were still at it, not one being broody. The gross return is £90 to £100 per annum, and the total cost of feed £40 for the ten months they have to be fed. He feeds in winter barley-meal, sharps, and bone-meal, given hot, early in morning; at afternoon maize, peas, beans, and wheat. He states that the fowls never do any damage, but "improve every foot of land they run on."

Mr. Ferryman, Copston, Hinckley, keeps 250 adult stock scattered about the fields in small lots of ten to thirty, and has done so on the same land for seven years, marketing his eggs and late cockerels locally, and rearing about 200 chickens per annum. Uses chiefly maize and wheat. He keeps the non-sitters at field houses, and the sitters at farm buildings. Finds they are most productive where run thinly—not more than five or six to the acre—and prefers White Leghorns, Silver Wyandottes, Black Orpingtons, and Buff Rocks. He says that the manure more than pays for the labour, and that he is satisfied with his profits and shall increase his stock.

Mr. Goodacre, Stockton, Rugby, keeps about 300 fowls in lots of thirty scattered about 208 acres of grass land. He gets 26,000 eggs per year, selling some at 2s. 6d. per nest for setting, and marketing the rest locally after destroying the germ. He considers laying hens the best paying branch of poultry-keeping, but goes in for a certain quantity of table fowl in addition, rearing 400 to 500 chickens annually. He feeds the field birds chiefly on maize, but only once daily in summer, and avoids overfeeding. He keeps Orpingtons, Leghorns, and Minorcas for eggs; Dorkings, Plymouth Rocks, and Orpingtons crossed with Indian Game for table birds. He does not give figures, but says his poultry "pays better than any branch of the farm."

Mr. Passmore, Wootton Wawen, Birmingham, who occupies about 200 acres of mixed land, keeps fowls in small houses about the farm in lots of ten to twenty-five, preferably of seventeen to twenty, which are kept in houses 5 × 5 and 6 feet high, made of ¾-inch tongued boards, with roofs of corrugated iron lined beneath with carbolised straw, renewed and replaced once a year; the houses have movable perches and two glass slides (to cover ventilators if required), and there is for cold weather a shutter 2 feet square, which when removed leaves an open netted space for free ventilation in summer. He prefers to keep one lot of birds in the same house for life, without removing them. In 1898 he thus kept 280 laying hens, which in 1899 were increased to 380. He has kept fowls on the same ground for six years, and his predecessor had kept a considerable number on one field of four acres for years previously; and his largest egg-production per hen lately had been from a pen of Silver Wyandottes in that very field. In 1899 his birds had the use of about ninety acres, and he was preparing to stock another ten acres with poultry, only increasing his stock as it pays its way, and buying fresh houses, etc., out of current profits. In 1898 he marketed 110 eggs per hen, and in 1899 120 per hen, besides what were used in the house and for setting. In 1899 he reared 575 birds, out of which he replaced the old ones and increased stock by 100, selling the balance. Early in the year cockerels are sold alive; later on the birds are dressed and sold to private customers; a few are sold at 4s. to 10s. for stock birds to neighbours. He feeds once a day only, unless snow is on the ground, when a second feed is given; averaging about 3 ozs. of grain per bird per day, less in summer and more in winter; using in winter one-third each of wheat, peas, and maize (ratio about 1:4½), and in summer two-thirds of wheat and one of peas (ratio 1:4⅛). An iron corn-bin is kept near and for the use of five houses, and replenished fortnightly, and he feeds when walking round the farm in the morning. It takes him one and a half to two hours daily, and his children collect the eggs. Extra labour for the chickens is charged, but he considers the manure more than pays for the labour, an opinion which we have seen is very general. He reckons that the fowls pay a profit of 5s. to 5s. 6d. per bird, besides eggs and poultry for the house, which is a considerable item. The houses are gas-tarred every year, which he states keeps away the foxes, and he puts in each house about 9 inches deep of sawdust on the bare earth floor. This is turned and sprinkled with carbolic powder weekly, and renewed every six months, each house being also tarred inside whenever vacated for a few weeks by the inmates being discarded.

Mr. James Fuller, of Framlingham, Suffolk, has been engaged in poultry-farming for over twenty years, and for several years his accounts were published in the local papers. The principal figures during 1897-8-9 were as follow: In 1897 he sold 538 birds for £47 8s. 5d. (about 1s. 9d. each), 48,055 eggs for £133 0s. 4d. at market prices, and £14 10s. 3d. for extra prices; total receipts £194 19s. Food and expenses were £74 3s. 10½d., gross cash profit £120 15s. 10½d., nothing being charged for rent or labour. In 1898 he sold 51,279 eggs for £171 8s., 439 birds for £53 1s. 7d., and had 114 more fowls in stock value (2s. 6d.), say £14 5s.; total, £238 14s. 7d. The food was £89 16s. 8d., and other expenses £13 19s. 4d., leaving gross cash balance of £134 18s. 7d. In 1899 he sold 51,453 eggs for £200 16s. 2d. (getting rather better prices) and 625 birds for £70 2s.; total cash, £270 18s. 2d.; while food cost £107 16s. 1d., and other expenses £19 4s. 8d.; cash balance, £143 17s. 5d. This left him with 675 birds to begin operations in 1900, almost exactly the same as the year before. The birds are kept on about twelve acres of pasture, and are taken off a part of this for six weeks or so, to grow hay; the fine stack of this, and the feed at other times for horses and sheep, more than pays any fair rent. As regards labour, Mr. Fuller himself has a coal business, and the fowls take all his own spare time a great part of the year; the rest a sharp lad does the work; of course, this ought to be charged, but on the other hand nothing is credited for the large quantity of valuable manure. All the birds are hatched and reared naturally, and eggs for market made the leading consideration, the cockerels being sold young, and the hens at two years, unless unusually good birds. The laying stock is fed about 9 a.m. and 2 p.m. on grain only, the eggs being all gathered at 3 p.m. after the last feed. He prefers Houdan-Minorcas, Houdan-Leghorns, and Houdan-Orpingtons, as making splendid layers and fair table fowls, the last cross being specially good as winter layers, as shown by the fact that 3,600 of his eggs were laid during the last three months of the year. He considers that these crosses can with care be brought up to nearly 200 eggs per annum each; and his own rough-and-ready test for the poor layers to be discarded is, those "the last down from roost in the morning."

The farms previously mentioned, with some others, appeared in our last edition, and we learn from Mr. Palmer that the particulars given still hold good. Those which now follow are the result of further investigations by Mr. Palmer, and convey the same useful teaching.

Mr. George Waldron, Cladswell Farm, Alcester, Warwickshire, keeps about 400 laying hens. His birds are a few White Leghorns, and a fair number of White Plymouth Rocks to do the sitting, and the bulk of the working stock Houdan-Leghorn first cross. He keeps the fowls at field houses, and some at the farm buildings; but owing to trouble by foxes he has wired in with six feet netting a field of about four acres. As this gets stale he will move the netting to another field. His birds cost 1½d. per head per week the year round. He feeds four mornings a week with soft food—pigmeal (a mixture from one of the large firms) one part, sharps one part, and a dash of malt-culms. For grain the birds get oats, wheat and maize, sometimes mixed and sometimes separately. Less maize is used in summer than in winter. The fowls have all they will pick up. He says that they pay better than any other branch of his farm, and that he can clear the rent of 100 acres out of the laying hens. He markets the cockerels as soon as fit, and rarely works a hen more than two seasons.

Mr. Forman, Brockey Farm, Stapleton, Hinckley, has kept fowls for six years. He has 500 to 600. His birds are White and Silver Wyandottes, White and Black Leghorns, White Orpingtons and Black Minorcas; while in first crosses he has Minorca-Wyandotte, Leghorn-Orpington, Houdan-Orpington and Campine-Wyandotte. Of the crosses he prefers the Minorca-Wyandotte. He says that either pure bred fowls or first crosses lay better than mongrels. He runs as many as sixty to the acre, and so far has not tainted his land. The food given is chiefly wheat and maize. He has no difficulty in procuring winter eggs. He rears artificially and with hens, but prefers the rearers. He does not consider that the manure is a sufficient off-set to the labour involved. He allows 6 per cent. depreciation per annum on home-made houses. The farm is 130 acres, and is farmed in the usual way and stocked with shorthorn cattle and Shropshire sheep. He says that they pay all right, but, like many others, does not mention exact profits. At any rate, he intends to keep on as he is going. He finds that laying hens pay better than table poultry, and markets his eggs locally at from fourteen for a shilling in summer and seven for the same price in winter. He believes in March hatching for winter layers.

Mr. Ward, Oak Farm, Burbage, Hinckley, is a poultry farmer pure and simple, and keeps about 600 laying hens and rears enough chickens to keep up his stock on ten acres of grass. He has been at it on the same land for nine years. All his land is divided into pens, and he does most of the work himself. His breeds are Leghorns and the Houdan crosses from them, some Buff Orpingtons and Houdan-Buff Orpingtons. He has also done well with some Brahma-Leghorns. He says that healthy fowls lay so well the third season as to make it worth while to keep them on and reduce the rearing. Another very large poultry farmer has recently expressed the same opinion. There is no doubt that with better management the hens are much healthier in the third year than formerly, and that the practice of keeping them longer will become more general. Mr. Ward gets 10s. worth of eggs from each hen per annum, and his food costs more than half of that sum. His average profit is about four shillings per hen. He has not been seriously troubled with any disease, and his fowls look healthy and well, although, taking the rearing into consideration, there must have been eighty fowls to the acre for some years. He admits that farmers with unlimited range, stubbling and arable land for a change can get more eggs than he can. He finds that fowls do not lay so well in large flocks as in lots of from six to ten, but thinks that the extra houses, netting and attendance would about equalise things. Mr. Ward prefers incubators and rearers to hens. He is a keen business man and buys very closely. He has recently filled his granary with maize at 25s. per 480 lbs., good white oats at 18s. 6d. per 352 lbs., and wheat at 29s. 6d. per 504 lbs. He considers 20s. per week a fair wage for attending 500 hens, but not enough to rear also the chickens to keep up the supply.

Conditions of Success.

The reasons why poultry are still thought nothing of upon many farms are not far to seek; but the curious thing is that they pay the worst just on that system of "a few round the homestead" so recommended by certain writers. In days when other branches of farming paid well, a few fowls were kept just to supply the house, and left to the women: thus the farmer never knew anything about them, and never regarded them as having money in them. Any outlay was never thought of, or return for it believed in; the fowls were kept on till very old, left to breed together indiscriminately, the stock was mostly of bad layers, and half the eggs were stolen by the farm hands. All this must, of course, be changed if profit is to be realised. A paying stock must be selected, and thereafter bred for laying or for table; necessary food and expenses must not be grudged; and eggs especially must be systematically collected and marketed promptly, special care being taken that none of doubtful age are ever included in consignments.

As to the stock, it is doubtful if a hen or pullet that lays less than 100 eggs in a year pays at all, while it has been proved over and over again that beyond 150 is perfectly attainable; while many farm hens lay under 60, and do not account for all of these. All *old* stock must first be got rid of, and then selection must follow. There are strains now bred and advertised for laying properties, as distinct from mere "fancy" points, from which a good start can be made in breeding stock: but if any farmer has a prejudice against "pure breeds," there is another course. Let him watch any neighbouring market, and get birds or eggs from any neighbour who brings in a good lot of eggs in winter. After that he must select for himself, hatching chickens only from his *best layers*, and crossing his pullets or hens with cockerels also from his best layers, and so on. It is simple as A B C, and in this way the average—that is, the "thing his hens lay on"—will be infallibly raised. If he or his people cannot watch the birds sufficiently to know the *best* layers, he can still do much by the three simple tests of which lay early in winter or spring; which are down earliest from the perch; and which lay earliest in the day. Broadly, these tests will at least pick out the better layers, and enable him to discard the really bad ones.

Question of Comparative Expenses.

Food and expenses raise an important and interesting question in regard to *farm* poultry. The example of Mr. Passmore above cited is in one respect rather peculiar: that of the one daily feed only, of hard grain. The egg-average resulting is, perhaps, fair, and as it was raised from 110 to 120, it might probably be further raised by the selection described above; but it is certainly not high. It is, however, argued with much show of reason, that such an average, *with such economy in food and labour*, pays as well or better than an average of 160 might do with more expense in these items. It is remarkable that the same question has struck some American egg-farmers in the same way. One in Massachusetts writes to an agricultural paper in New York: "There is just as much profit in producing eggs at a cost of 10 cents per dozen and selling them for 20 cents, as there is in producing more at a cost of 20 cents and selling them for 30 cents." The same argument may or may not tell in any given case against the cost of producing winter eggs by high feed: it is a question of figures, and therefore depends for its answer upon prices and markets, and cannot be positively answered for all cases. Mr. Passmore evidently knows what he is about: but on the whole we think he would find it profitable to give in winter a good allowance of cut bone.

The same applies to another point. In Mr. Palmer's own lectures, we notice that he strongly advises the plan of broadcasting the grain upon different strips or portions of ground on successive days, a point we have not seen suggested before. Where this plan can be carried out it must undoubtedly be beneficial in two ways: the food falling upon sweet ground, and the manure dropped during the day being also more evenly distributed. On the other hand, it is obvious that there must be many cases in which such a plan, carried out thoroughly, would involve more walking and expense in time than can be afforded. To some extent, however, it will always be possible, and the point should decidedly be kept in view, and feeding on the same spot carefully avoided.

Honesty.

In regard to the marketing of birds killed, there is nothing to add to the preceding chapter; but an emphatic caution is necessary about the marketing of eggs. Twenty years ago there was no wholesale market in London for "new-laid" eggs, and even now private custom pays the best, where sufficient; such private custom is generally well treated, because the consequence of any other course is felt directly. Where there is no private market, however, there is now, as shown in our next chapter, a London wholesale market ranging from 9s. to 20s. per 120 according to the season, and with a tendency to increase both in demand and price. But this altogether *depends upon the farmers*—upon their sending up *really* new-laid eggs twice or thrice a week, with rigid honesty. We regretted to find from a large salesman that the greatest difficulty was with the farmers themselves; some of them were in such a state of besotted ignorance, that in their short-sighted greed they would retain their eggs till they had a large lot, or for a better price, and *then* send them up as "new-laid." That sort of thing at first nearly killed the new and promising market, and was only checked by relentless refusal to receive any more from proved offenders. It still checks the market and the price more than anything; and only the absolutely *honest* consigner, who sends up exactly what he undertakes, can expect to reap the benefit of extra "English" prices. The establishment of egg depots and wider dissemination of knowledge should do much towards sounder practices in this respect.

Larger Operations.

Poultry-farming may also be carried on, if not "pure and simple," at least in a much larger and more exclusive sense than that above considered. As mentioned later in this work, there are several establishments where ducklings are reared and marketed by thousands even in England, known to be remunerative; but ducks are in some respects easier to manage. Much of the business described in the preceding chapter, again, can only be properly described as poultry-farming. It is ridiculous to refuse such a title, as some would do, to cases where 600 birds are reared on nineteen acres, and the milk from the few cows is separated and all given to the chickens; or to Mr. Kenward's 200 acres, where 8,000 are reared, and the main cereal crop is oats, all fed to the birds, with all the skim milk also; or to many others where the oats and the cows are complementary to the chickens. The poultry are in all these cases the centre and mainspring of all the operations, which alone have made the holdings pay, and without which the whole would collapse; not at all the mere "bye-product" so constantly asserted. With education of a wider purchasing public, and the opening up thereby of fresh urban markets, it may be hoped that there is room for the extension of the Sussex system in other districts near the larger provincial towns.

Whether still more exclusive devotion of land to poultry products will be profitable, is a question of more difficulty and uncertainty, and depending far more upon personal qualities. Absolutely "exclusive" poultry-farming, we have already seen, is impossible, since it is absolutely necessary that something should consume the manure, to keep the land sweet and to pay the rent while it is sweetening; but it may be broadly admitted that in "poultry-farming" more technically so-called, there would not be much more of other products than assisted in this, or to keep cows whose milk was wanted for the chickens. So much, however, would be essential, and must therefore be taken into the scheme. It would also generally be the case, that such farming would partake more of the character of egg-production than of chicken-rearing, the market being steadier and better for new-laid eggs, in proportion to the vast mass of inferior imported eggs, than it is for chickens. Can such a farm be made to pay?

We are constantly told that it cannot. A writer in 1899 stated that "it is utterly impossible for a poultry-farm to compete with the cottager, who has neither land, rent of buildings, labour, nor cost of conveyance to market to pay for," because a farm must pay for all these things. The argument itself shows the folly and ignorance of such dogmatism; for Heathfield is cited in the article as the type of the cottager system, and we have just seen already how in that district the "farms," which have to pay rent and all the rest, do "compete," and that more and more every year, with the cottagers who are said to pay none. Thus real knowledge, and practice, and figures, are rather conspicuously at variance on the very threshold, with this particular *à priori* theory, and we have found it much the same in regard to other theories which have been put forward in the same confident manner. It is further to be remembered that in America the question of poultry-farming has long ago been solved in the affirmative; but not even there without many failures, and where success has been achieved it has been by hard work and marked ability; and though this does not prove that it would be so in England, it does prove that the matter is one of figures and circumstances, which in regard to cost of land, and food-stuffs, and incubation, have changed materially in favour of poultry during recent years.

Failures.

Failures have been numerous, however, and especially amongst such as have rashly "embarked" all at once in considerable operations, without preparation, or knowledge, or apprenticeship. In their case it is hard to see what else could be expected. No other business would ever be attempted in that way. Some of the alleged failures have, however, taught much to those able to learn their lessons. In 1879 we met personally, on one of the Clyde steamers, a gentleman who was introduced to us as having taken up egg-farming in Scotland, failed, and given it up. He told us that if he could have averaged twenty eggs more per annum from each bird it would have paid him, and he should have kept on; anything over that would have paid very well. He got about 110 each. It is absolutely certain now that 150 to 170 can be secured, and such an average would have put an entirely different face upon that particular attempt.

Another case, much paraded as a failure at the time, was that of Mr. Carrington, reported by Mr. Druce to the Royal Commission on Agriculture in 1882. He gave up a large farm owing to the depression, and tried a large stock of poultry on 100 acres, at Kimbolton; his stock in October 1881 being 1,800, soon to be reduced to 1,500. A man and boy were engaged and charged, with £38 for rent, £18 10s. depreciation, £15 interest on £300 sunk in capital, and the food. The receipts summarised were, £461 11s. for birds and eggs, £3 for feathers, and £27 for manure; and the profit was only £25, which was rightly pronounced "not very satisfactory." On the other side it is to be said, that in the first place, and even with the mistakes to be mentioned, the fowls did pay this beside the interest and the rent, and in point of fact paid *better than any other branch of the farming:* that surely is a startling fact. But the practical mistakes were serious. The number of eighteen per acre is not nearly enough to work land to advantage in poultry-farming, while too much for such poultry merely increased on a farm, as we were just now discussing. The fowls, again, were all light Brahmas, and were fed three times a day; a most wasteful system in every way, and a bad selection of stock, such as would most of all suffer from such feed. And the bulk of the birds were kept in flocks of 150 each, a number far too large. Any practical breeder, or even farmer, will see that mere common-sense applied to these details alone, would soon have worked a tremendous difference in the receipts.

A third case of failure we select, because it has been specially mentioned by Mr. Tegetmeier, and points a moral which it is very necessary to enforce. It was a poultry-farm started on 114 acres belonging to Sir Robert Buxton, at Rushford, in 1882. A brick incubator house was built and stocked with eight 200-egg machines; the ground was fenced by wire: the land, it is said, well adapted for poultry. To quote the further description exactly: "Ample provision was made for the artificial supply of heat for the rearing of the chickens, which were not to be overcrowded on the land, and were not to exceed from 60 to 100 per acre. The breeding birds were to be located in runs separated by wire-work, and not more than from a dozen to twenty kept together. The manure was to be carefully collected and utilised. There was to be an intelligent poultry-keeper; two labourers, their wives, and a boy under him. Although the poultry was chiefly to be bred for the market, a careful selection was to be made of the best stock. . . . *It is difficult to imagine a poultry farm conducted under more advantageous conditions.*"

Such an assertion as the last, from any man pretending to a knowledge of poultry, is simply astounding; for nothing could possibly be worse, more absolutely certain to end in a dismal failure. Just observe the conditions. Here was a sudden rushing into large operations, in practical ignorance of the whole business; a stock collected of no special excellence; an "intelligent poultry-keeper" and two men and two wives and a boy to pay for, and on whose management and work all depended; and as the foundation of all, to be run by one or other of the above, or all combined, eight 200-egg incubators and corresponding heated brooders, *with only the knowledge and experience in incubators of that day!* What does almost pass belief, is the folly that could launch out in such a way. Beyond doubt, there is no shadow of a hope for any such adventures in poultry-farming as here described.

Conditions of Success.

Wherever success is to be attained, it must be reached by methods widely different from this. It must be recognised that the business is not an easy but a difficult one, demanding apprenticeship and personal knowledge of it, and commercial aptitude as well. It demands steady and progressive preparation and foundation beforehand, which will itself absorb time and capital, if only for subsistence in the meantime, because one cardinal condition of success in an egg-farm is a stud of birds *bred for laying*, which cannot be purchased right off at any commercial figure, though good breeding stock, which shall be its foundation, may and should be. And, moreover, the intending poultry-farmer has to make or find *his market*. We are constantly asked where produce "can be sold" at good prices, and people seem to think there is an absolutely unlimited market always waiting at top prices, to absorb any fresh supply at a day's notice. There is no such market: a new supply has to "work in" by degrees, and make its own reputation, so that merchants and dealers may know by experience what they can rely upon. All this work is gradual, and as it proceeds, so should expansion keep pace with it. Of course, all this may go on together. Beginning in quite a small way to breed a stock of good layers from a pen of good layers, may give practical apprenticeship, and send a *few* birds and eggs to market; the first few *paying as they go*, though not enough to make a living. Then, as things open out, may stock and plant and operations be extended; or perhaps on the other hand the operator may find that he is not succeeding, and not likely to succeed, in which case he had better find that out before sinking much money in the attempt. All the time he must be breeding up his layers, and as soon as things get beyond his own hands, training each one of his staff, and so on. It will all work together, and eventual success will mainly depend upon how this preliminary work is done; and those who are deterred by the prospect of such slow proceedings, are simply those who ought to be deterred, and who would only incur ruin by proceeding in a rash way. A large paying business is only to be built up out of a smaller business which already pays, and which will teach expedients and methods as one goes along.

The Labour Difficulty.

The scale to which such poultry-farming might be capable of extension, would differ widely in various cases. Labour remains the great difficulty, for there is an amount of hard work which few have any idea of. In Sussex, many of the people engaged in the industry work hard from dawn to dark; and organising power is required, as well as practical knowledge, to manage subsidiary labour. We have been repeatedly struck by statements from successful poultry-farmers in America, to the effect that they did well up to a certain point, where they could manage all by themselves, or with a labourer immediately under their own eye, but that when they got beyond that, efficiency fell off, and profits with it. Our own experience was that in our absence all day it was peculiarly hard to get even such a simple thing as cleanliness maintained by a man—and we had three in succession—in the sense we understood it; these American farmers say exactly the same; and efficient and faithful labour remains the chief practical difficulty. One man might succeed here—*i.e.* in controlling labour—where another would utterly fail. But a very important point to consider, before entering into any enterprise of this kind, is the peculiarly *exacting* character of the labour required. There can be no holiday; the birds can never be left. It is work that never ceases, for long hours, day after day, with no relaxation: absence of the labourers would mean disaster, and of the superintendent, peril and neglect. This is an aspect of the business which we very rarely see pointed out by writers on poultry matters, and which never seems to strike some who desire to embark in it.

Management of the ground is better understood at this date than formerly, and, in connection with this point, fencing is the chief difficulty.

Management of the Runs.

It is perfectly well known now that land double-stocked for half the year, or if need be every alternate whole year, to the extent of fifty birds in a quarter of an acre, keeps perfectly sweet, and will raise a good crop from the manure meantime. So far back as 1880 we suggested, with some hesitation, the cutting and selling of hay in combination with poultry, but the suggestion had never then been carried out that we are aware of. In several cases known to us since this method is practised. We were once staying for a day or two with a gentleman who owns 123 acres, of which some is wood and coppice for shooting, and who for several years sold nothing off the land but poultry products and hay. He could not be called a poultry-farmer strictly; for he had not his living to make by it, and was fond of experimental changes in his operations. One year he reared little but chickens and some turkeys; the next fewer chickens and a large number of ducklings; and he was then thinking of largely breeding pigs. But he was confident that he made more by this simple system out of his holding than *he* could have made in any other way, the only drawback being the difficulty of extra labour in the hay harvest. The land was scrubby and worn out when bought, but about ninety tons of hay had been cut the preceding season, worth say £3 5s. per ton, and this hay had been *made* by the birds. One year 8,700 chickens were marketed from the farm, which was not fenced in runs except for the breeders, but was managed in natural fields.

With flocks in defined runs, management will be more difficult. Fowls fall off in egg-production when in too large flocks, and cost too much in labour when in too small. The best compromise is generally reckoned to be about fifty birds together. Double-stocked, such a flock needs a quarter of an acre for six to twelve months, thence to be removed to another sweet run. If scythe-work can be managed, double runs are easy enough, but there must be removable lengths of fence to allow of a cart passing for loading the hay. Cows and goats and sheep have also been grazed in such vacant poultry runs. Moving the entire stock to another half of the whole farm would be best of all, but the fences of the runs hinder operations of that kind. It is to be remembered that the mere value of the manure, or of the extra crop, is not the only point involved in this question of alternating a crop with the poultry; it is that the manure is thus *consumed*, and the land kept permanently sweet, which can be done in no other way except by an excess of land beyond what is needed.

From time to time the proposal is revived to economise plant and labour on an egg-farm by ignoring fences and separation of flocks, and keeping a large number together. We are not here referring to the well-known "colony" system in America, in which separate houses wide apart are provided for moderate flocks, absence of fences being compensated by distance, separation, and sense of locality. Such a system is really costly in labour, but not necessarily unhealthy, and is pursued with some success; though it appears to be declining in the localities where it has been chiefly carried on. But it has been taught in some quarters that hundreds of birds should be kept for economy in one large house for roosting, and with as many as two or three hundred head per acre. Doubtless if the fowls could be permanently kept in this way, the manure they made at night being only cleaned out at long intervals, the economy in labour would be very great; and as we have already pointed out that overcrowding may often go on for quite an unexpected period with apparent success, as it had done on the very place at Orpington which ultimately supplied Dr. Klein with material for the study of contagious fowl enteritis, the danger of such a course does not always appear until some time has elapsed. But, as already said in an early chapter, sooner or later Nemesis comes: and cases have frequently been reported in which the following of methods of this kind

Crowding Impracticable.

has been ultimately followed by disaster. Even official reports of a sanguine character have been published and circulated broadcast concerning operations carried on for an entire year on such lines; but the promise in those reports of a similar one for the second year, was never fulfilled, and upon inquiry we were officially informed that it could not be issued, "as the experiment was not brought to a satisfactory conclusion." It is simply impossible, in any moist climate at least, to succeed permanently in poultry-farming without adequate run.

In every case of failure in egg-farming known to us—and we have investigated every one we could hear of—the failure has plainly resulted from neglect of one or the other of the essentials here stated, and generally of more than one of them. The thing has been rushed into; or there has been inadequate run to keep sweet; or nothing has been done to secure a high laying average; or a good market has not been secured, or a location whence the product could be got to market with facility; or things have been carried on in a lie-a-bed, take-it-easy fashion, which never pays in managing fowls. But in spite of what is so often alleged by people who really know nothing about it, cases of more or less success are not wanting, even in this country, if people really look for them. A small scale is, of course, most common. Years ago, we published one of a tenant near Chesterfield, who had an acre and two roods of land, and the run besides of two acres of wood. The two roods were used for fruit and vegetables, kept going by the manure, and fruit trees were also planted in the acre divided into runs, a pig being also kept. The wife looked after things, and from this holding, as nearly as possible 50,000 eggs per annum were sent to London, mostly to direct customers, with whom a connection had gradually been built up. Other somewhat similar instances, both on a somewhat less and also somewhat larger scale, have been reported from time to time.

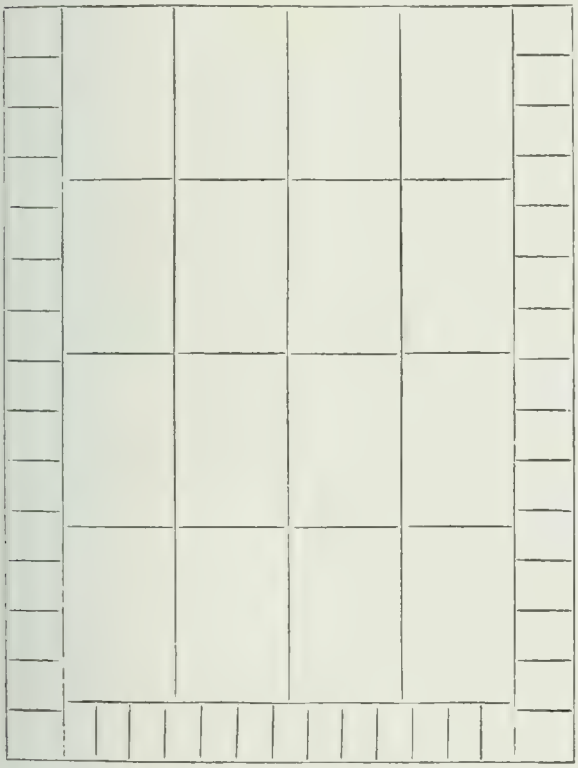
Examples.

Another case that might be cited is that of Mr. Simon Hunter, mentioned presently in connection with a poultry-farm of quite another kind. Previously to that, he had occupied another farm in Wensleydale for fourteen years. On this, he informs us, he bred and kept flocks of hens especially to lay eggs for market, and found them pay reasonably well, though less profitable than the line into which he was gradually led. From the first he bred his birds from selected layers, and got his average up gradually to 160 or 170 each, and after allowing for labour, he reckoned the profit at about 5s. per bird: it was, in fact, the reputation of these birds which gradually led him into the other line presently described, and it is manifest that a stock which is known to give such results, will *as such* have a value, and fetch enhanced prices for stock, quite apart from show points. He had a stock on this farm of 70 to 80 birds per acre, and at the end thought the land was getting rather foul, which could, however, be easily prevented by the systematic rest and crop on which we have been insisting. We have no definite figures of the results, but we have the significant statement that the farm presently described, at Northallerton, was "purchased out of the profits of the other farm," which is tangible enough in regard to the question of success or failure.

There are some examples, even in England, on quite a large scale, though from the nature of the case few and little known, for the simple reason that the owners very much object to be either pestered with useless correspondence, or to have their methods and markets and arrangements discussed by press-writers, who have often done much mischief. However, an interesting example is the poultry-farm of Mr. T. W. Toovey, at King's Langley, in Herts. Since this establishment was described in the last edition of this work many changes, suggested by experience, have taken place. The whole farm has been re-modelled, perhaps twice or thrice. And Mr. Toovey declares that if he were commencing now he would build only two types of houses—the apex and the new type of small lean-to for hens, and long sheds for ducks. The farm at King's Langley is a poultry farm pure and simple; and when it is intended to keep poultry solely on the land, Mr. Toovey considers that the plan in vogue there is the only possible one. Large runs, each a quarter of an acre and containing twenty-five birds, or small runs of about 550 square yards containing a dozen to thirteen fowls is the system adopted. The apex houses are now built of one type only, *i.e.* 9 feet long, 7½ feet at base with 7-foot sides.

At King's Langley nearly 2,500 birds, including about 250 stock ducks, are kept, while there is ample accommodation for the rearing of 1,500 chickens. But a much greater number is hatched and partly reared, since these are despatched direct from the coops to Mr. Toovey's other farm, where, on the fields and pastures, some 3,000 chickens are run. The chickens are roosted mainly in the new houses, of which there are some 312 altogether. The special feature of these houses is that they are so constructed that the birds cannot crowd into them, but have to allot themselves out from house to house, however closely they may be together. Without such houses it would be difficult to see how operations could be carried on on the scale they are. What are known as the Well Farm Poultry Runs are certainly unique. Here 3,250 laying hens and male birds are kept on ten acres for one year on the arable land. Three men look after these, and, besides, up to as many as 3,500 chickens of all ages, but at times the assistance of a pupil is also required.

The whole plant has been evolved from much careful thought, and the practical experience of years is embodied in it. There are sixteen large runs, each containing about 135 birds (125 hens and 10 cocks), and forty-three apex houses. The following diagram clearly shows the plan upon which the ground is laid out:—



The small outside runs contain the forty-three apex houses, fifteen being down each side, and thirteen in front, and consist of 300 square yards. In the large runs are ten small houses, ten detached large nesting boxes, and three dusting-sheds, and they have an area of 3,000 square yards. As regards the floors of these houses, those of the apex type have first a layer of earth placed in them and then a layer of peat moss, which keeps well for twelve months. The small houses are placed on the bare earth and are moved weekly. Each apex house accommodates 25 birds, thus allowing the poultry to be kept at the rate of 400 fowls to the acre. As, however, the birds spend much of their time in the large houses, the ground keeps perfectly well for one year. In the 1910 season one man re-erected the pens in nine days, and it is thought that in future only eight days will be required for this work, which is done in the autumn. The ordinary staff moved the houses and took down the wire-netting in the same time. This meant that all the houses and birds were moved some 400 to 500 yards, that being the distance from the new pens to the old ones. Just about seventy rolls of wire-netting are required for the pens.

Mr. Toovey's poultry-farm was commenced in 1899 in a very small way, and has grown year by year. It is, however, not intended to develop it further, since to do so would mean interference with other agricultural arrangements on the farm. Mr. Toovey is of opinion that poultry-farming is very little understood at present by the majority of poultry keepers, and more especially self-styled "experts." Those engaged in poultry keeping operations at King's Langley find that they learn something new about the subject every year.

The Stock.

Stocking a farm largely devoted to egg-production calls for some judgment. Table quality is here not the first consideration by any means; but yet it is of some importance, for cockerels and hens will have to be marketed, unless disposable as breeding stock. Size of eggs must also be taken into consideration, and even the colour, since brown eggs fetch a better price in this country. Leghorns and Anconas, hardy as they are, rather discount a market in these points, and among crosses to be recommended, the Houdan with Minorca, Leghorn, or Buff Orpington, deserve attention as either giving table quality or colour to the eggs. The layers must either be found by observation, or in a farm of this kind it may be worth while to employ trap-nests.

Whatever differences there may be in many points of management, care should be taken to make up a flock of hens or pullets of the same age, and about the same time of hatching. This is essential towards being able to manage the entire flock *as a unit;* otherwise every single bird has to be watched, which greatly increases care and anxiety. When, on the other hand, all are of similar age and breed, if one or two show signs of ceasing to lay, or of moult coming on, it will be known that the others are likely to follow, with other flocks according to age; and arrangements can then be made in good time for slaughter or sale if necessary.

Special Products.

But anyone who can run a poultry-farm of any kind ought certainly to aim at getting products of *some* kind which shall find purchasers at more than market rates, and in addition to these. Eggs or stock from really proved layers always find more or less demand, and can be sold with advertising and management; and if the birds are true to points, they will be worth still more, even though no attempt be made at exhibition standard. During recent years quite a demand has grown up for newly hatched chickens, sent off within twenty-four or thirty-six hours of being hatched in incubators, at which age they travel *better* as a rule than later, when they have become dependent upon feeding. The prices of such birds range from 9s. to 42s. per dozen, according to quality and date when hatched, and as they are turned into money with no further risk, when the stock is strong and fertile they pay well. Experience shows that a very large number of people are anxious to purchase stock of this kind, partly as stock, and partly, to all appearance, for the pleasure of rearing them. The following remarks on the despatch and management of such infant chicks are supplied by Miss N. Edwards, of Coaley Farm, near Dursley, who has worked up a connection of this kind amounting to many hundreds of chicks weekly in the spring, and also in eggs and stock, at moderate prices, as well as a limited number from exhibition stock.

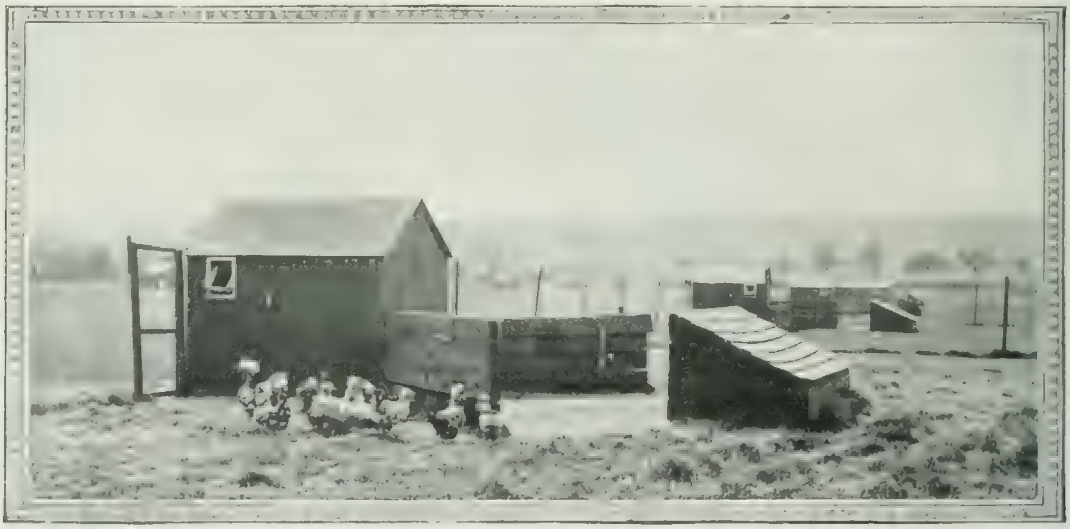


Fig. 71.—Shed and Wall Shelters at Sowerby Grange, Northallerton. Since this photograph was taken all pens have been boarded round and the wall shelters dispensed with. (See Fig. 73, p. 159.)

"There is no doubt that the business of selling newly hatched chickens is greatly on the increase in this country, and it is likely to develop farther each year. The selling of settings of eggs is so often unsatisfactory both to the vendor and the purchaser. If a brood of healthy chickens arrives safely at its destination, the purchaser sees at a glance that he has what he ordered.

"The chickens should be despatched as soon as dry and strong enough to stand. Any not strong on the leg are likely to be crushed by the others, so it is necessary to pack in the order in which they are hatched, as a few hours makes a great difference in the strength of the chick and its ability to stand and walk. The number which will travel best together is twelve; fewer are not enough to keep each other warm, and if more are packed together, some are likely to suffer. A box 9½ inches long, 6 inches wide, and 5 inches deep is the best size for the dozen. Below the lid, at back and front, half an inch of the wood should be taken off, or a number of half-inch holes pierced, thus allowing plenty of ventilation.

"In packing, a warm round nest of hay is made in the box, and a nice thick piece of flannel is caught with tin-tacks at the four corners of the box, low enough down to rest on the backs of the chicks, and beneath the opening made for ventilation. This covering answers two purposes, (1) the chicks are more comfortable with something resting on their backs, and (2) should the box get overturned in transit, the chicks do not come in contact with the hard wood, as the covering is some way down from the lid. When the weather becomes warmer, thinner flannel can be used, as the chicks need less protection; and in summer the chicks can be covered with open canvas. It is most essential that the nest should be round or oblong, and the corners filled up with separate wisps of hay, so that wherever the chicks nestle none can get into a corner, as this would mean crushing and death. As they are provided by Nature with food for twenty-four hours, they travel long distances before feeling hunger, and so do not trample each other in search for food. When despatched by night express trains they arrive at their destinations for their first meal, and I have sent successfully to remote parts of Scotland, Ireland, and the Channel Isles.

"Should there be any delay in transit during intensely cold weather, and the chicks arrive seeming somewhat lifeless, they should be immediately placed near the fire and thoroughly warmed, and afterwards will show no ill effects for being delayed *en route*. If it is intended to rear them with a hen that has been sitting three weeks or thereabouts, one chick should be given her at dusk, and by the morning it will be seen whether she means to take to the brood or not. She usually does, provided she has sat the usual time. When a brood of chicks is ordered with a hen, the chicks should be packed as described, and the box tied to the inside of a hamper with the hen beside it. She hears the chicks, and keeps quiet on the journey."

A more impressive example of the same kind of business on a much larger scale is the poultry-farm carried on by Mr. Simon Hunter at Sowerby Grange, Northallerton, since the year 1891. Demand for eggs and stock bred for laying on his place in Wensleydale, as mentioned in a previous paragraph, showed an opening and market at much better than mere market prices. This was gradually extended with corresponding decrease of the other branch, and it is now fully twenty years since any eggs were produced purely for consumption. Ever since he first commenced his poultry operations, Mr. Hunter has made a point of breeding solely from carefully tested layers, with the result that his laying strains have acquired a world-wide reputation. Trap-nests are used to a certain extent for the purpose of ascertaining the best layers, while those pullets that grow right away from, and commence to lay before, their sisters are retained, as are also those birds that lay right through their moult or during most severe winter weather. Mr. Hunter does a large business in

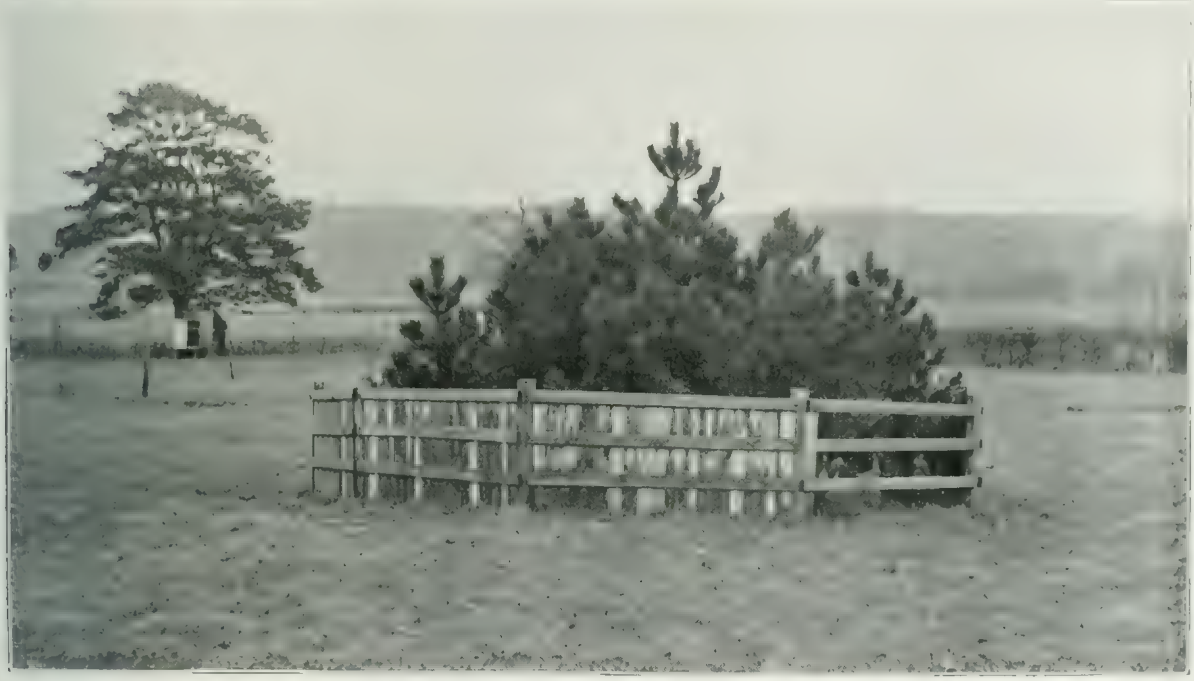


Fig. 72.—Spinney Shelters at Sowerby Grange, Northallerton.

the sale of eggs from pure breeds of poultry for incubation purposes, and also in pure-bred fowls. His egg sales alone range between 7,000 to 10,000 sittings per annum. These eggs vary in price, according to quality and season, but average about 6s. 6d. per dozen. The number of fowls sold is also considerable, and prices range from 7s. 6d. to 20s. each for good stock birds, while occasionally as much as £10 each is made on the choicer specimens for exhibition purposes; but the bulk of the business is at moderate prices. A really exhibition standard is not indeed aimed at, laying qualities being the cardinal object; but true type and purity of breed are maintained, and high prices are paid for suitable birds for a change of blood or to renew the shock. Mr. Hunter has devoted much time and an immense amount of money for the purpose of securing good laying strains of fowls, and he has travelled far to inspect such stock, having visited nearly every noted utility breeder, not only in Great Britain, but in America and Australia, who is devoting attention to this class of stock. The farm, in fact, comes nearest of any we know to the large American breeding farms.

From the point of health and accommodation, this farm sets a high standard. There are forty-three acres of land, the fields near the house being devoted to chicken rearing, for which coops are arranged in long lines, widely separated; Wyandottes chiefly are used as mothers, but about half the chickens are hatched and reared artificially, while many chickens are also raised by neighbouring farmers. There are 150 breeding pens, each containing from ten to sixteen birds, and from these the main part of the farm is divided into 150 runs of about a quarter of an acre each. To keep the grass short about fifty sheep are kept and grazed in one or another of the runs; and when the breeding season is over, two or three of the pens are put together, and the grass in the vacated runs is allowed to grow a few weeks and then mown for hay, a mower being used, and a length of fence made movable for passage of the mower and carts. The hay is reckoned to be worth fully £100 annually. After mowing the birds go back to the clean and sweet ground. The runs are boarded all round to the height of three feet with three feet of two-inch mesh wire stretched tight on top to keep all taut, the height over all being six feet. There are about *seven miles* of this fencing on the farm. Another special feature is the water supply, which is laid on all over the farm by pipes from a spring and tank, running into deep wells; the drinking-troughs are below the surface and sheltered by boards above, so that they rarely freeze. The cost of this was considerable, but it keeps all sweet and saves much labour.

But it is in the attention given to *shelter* that this farm specially excels. We have always upheld the great importance of that point when many runs are involved, but know no case where it has been studied as at Sowerby Grange. Each pen has a house 7 feet by 7 feet with a pitch roof, which is double-boarded, and the space in winter padded with hay. Near each house is a low, open shed, in which is kept half a load of dry peat moss dust for dusting; but the shed never faces the door of the house, so that the birds must go round into the open. In the centre of each run is an octagonal board fence, 3 feet high, closed on all sides except for the one by which the fowls enter, the diameter of the octagon being 16 to 21 feet. In each of these is planted from seven to nine spruce firs or Austrian pines, which give complete shade and shelter to the fowls. One of these "spinney" shelters is shown on the preceding page.

Five men are in constant work on the farm, with extra assistance at times. The fowls are fed twice daily, with mash in the morning and grain at evening, animal food being fed freely in winter and early spring, for which a horse is used weekly, the flesh being well boiled and minced, and mixed in the mash with the broth. In the afternoon the five men start round, each with two pails of grain, bringing the eggs back on their return.

The houses on this farm cost about £3 each, and the fencing of each run, including "spinney" shelter, about £6. The money sunk in fitting up, draining, and stocking was reckoned at about £3,000, but additions are always being made, about £2,000 being spent in extensions during the years 1902 and 1903 alone. All that is beside the original purchase of the farm, while in 1908 Mr. Hunter purchased a larger farm in Devonshire, which it is intended to devote to the production of high-class exhibition stock. All through, dating back to the former Wensleydale occupation, the fowls were made *to pay as they went*, and gradually pushed and extended as they did pay; and the whole has been bought and paid for, besides a good balance at the bank, out of poultry-farming.

Success like this can of course not be very frequent. Besides thorough practical knowledge and industry, there is in this case to be easily seen a strong individuality and power of organisation and management, which are never common; ability to see an opening, and quickness to take advantage of what was then a comparatively new demand; and skilful and systematic advertising. There are several other large undertakings on somewhat similar lines, however. Mr. Randolph Meech stated that he sold over 76,000 "utility" eggs for sitting during the year 1903, and this particular line, of providing stock bred for utility from pure breeds, is one of the branches of the poultry industry.

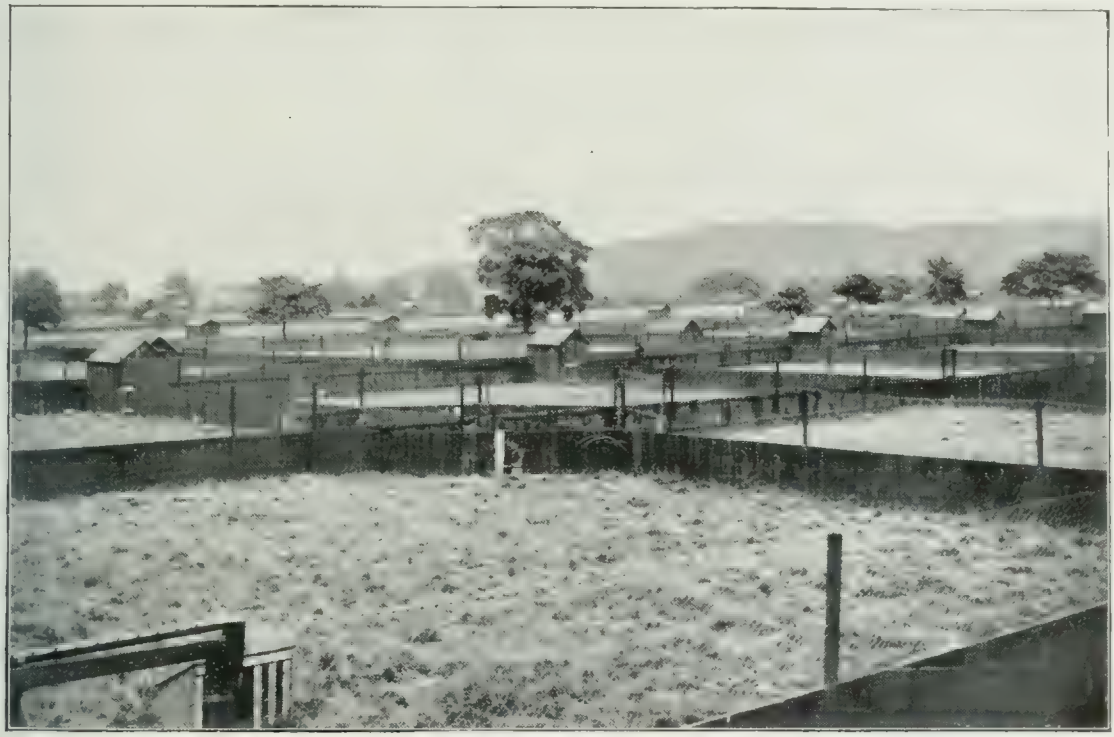


Fig. 73.—Portion of a ten-acre field at Sowerby Grange divided into sixty breeding pens.

Breeding Prize Stock.

There are other establishments which make considerable sums, some which even furnish the entire income of the proprietors, from breeding prize stock at high prices. Success in this branch is not particularly rare, and when it is reaped, means greater profits at less expense of time and labour and buildings than any of the foregoing. But we have regretted to see this kind of breeding often recommended as if the returns were both large and certain. That is not so; it demands special qualifications and aptitudes, and any great success must from the very nature of the case be confined to a limited circle. Breeding of this kind will be treated of in later chapters of this work, and scarcely belongs to the subject now under consideration.

American Poultry Keeping.

In the previous edition of this work much space was devoted to certain aspects of American poultry rearing. Since, however, some of the projects to which reference was made subsequently proved to be abortive undertakings, and, moreover, as much that was treated of in the letterpress was applicable only to countries that have, unlike Great Britain, similar climatic conditions to those prevailing in North America, it has been considered desirable to eliminate much of this information peculiar to the culture of poultry in the United States. No treatise on poultry farming would, however, be complete without mention being made of the colony house plan of rearing fowls, a system that has a wide vogue in America, especially in the Eastern States. The system, as its name implies, consists of keeping fowls, generally laying hens or growing stock, in colonies or flocks, in short, gregariously. The plan was recommended by Mr. H. Stoddart so far back as the year 1872, flocks of laying hens being placed in cheap houses dotted about the farm 150 to 200 feet apart, perfectly unfenced, or in any ready-made quarters available. The plan is recommended as costing much less in plant; and in Rhode Island there are many farmers who keep 500 fowls in this simple way, while there are a few who rear 1,000 to 3,000 birds under these conditions. The idea is that money is saved in plant, in food and in labour, and also, as the fowls forage so much for themselves, a day or two's neglect works little mischief. It is admitted that the egg yield is not extraordinary, but it is asserted that this lower production at less expense pays as well as, or better than, a high average at the cost of expensive food and buildings.

It is, however, by no means always the case that the house of simple construction is the one in use; indeed, nowadays all types are affected, from the latest approved fresh-air Tolman or Woods structure to the modest roosting place made from large, heavy dry-goods boxes, as may be seen in the yards of Mr. Carl H. Krippene. Usually, in the case of laying hens, twenty-five birds are allocated to one house, but in some instances as many as fifty compose the flock. During the daytime, when the fowls are at liberty, they all mix together indiscriminately, and, it is contended, they sort themselves out at roosting time. How this is accomplished without overcrowding taking place in some houses when growing chickens are placed in such erections, as is sometimes done, it is difficult to understand, unless a plan similar to that adopted by Mr. Toovey, as previously mentioned, is in vogue, especially as the buildings are very often only a few yards apart. An excellent example of this plan is to be found at Little Compton, Rhode Island, on a farm which is the gradual growth of over forty years. There are 200 acres, and over forty years since the chief produce was beef. The owner began by doubling the usual number of hens as kept in the district, and gradually developed his stock until he had a hundred detached houses, each 8 feet by 12 feet, placed in rows about 150 feet apart, each roosting about forty hens —say 4,000 in all. The birds are regularly fed twice a day, with mash in the morning, a wagon driving round and bringing back the eggs. The houses cost about twenty dollars each, being rough and cheap, of board, and no pains are taken to avoid cracks. The birds are at perfect liberty to go where they like, but seldom mix much. All the houses in a row are emptied and refilled at the same date, when the new birds are shut in the houses for two days, and then let out a little before night to be fed close round the house; they return quickly that night to roost, and are then given liberty. No males are placed with the laying stock.

In his excellent "Report of the Poultry Industry in America," published in 1906 by the National Poultry Organisation Society, Mr. Edward Brown, referring to his impressions of the colony house system, says that where farmers and others desire either to devote only a part of the land occupied to poultry, making, however, the fowls a leading feature of the work, the colony system extensively used in the Little Compton district of Rhode Island should be adopted, taking care to remove the flocks on to fresh ground every year or two years, and after cropping, not to use again until the manure is exhausted. Under this system, by the erection of wire netting fences around the entire range, Mr. Brown is of opinion that the fox difficulty would be largely overcome, and the repression of poultry-keeping in hunting districts removed, to the increase of returns to farmers; and, moreover, by this plan large areas of land at present uncultivated could be profitably occupied, more especially in connection with small holdings, in many parts of the country, to which it is specially suitable.

CHAPTER IX.

NATIONAL AND COMMERCIAL.

IN considering poultry and poultry products as national food, or as a branch of commerce, or as an industry, the point which most forcibly strikes any British student is the constant and enormous growth of foreign imports, and of eggs especially. Hundreds of writers have commented upon the fact, and the statement that "millions of British money goes out of the country for foreign eggs which might just as well be produced at home," is a commonplace of leading articles which appear in the principal daily papers with statistical regularity every year. Giving only alternate years for the sake of space, the following simple table gives the number of eggs imported into Great Britain, their declared value, and their average declared value per long hundred or 120, from the year 1856 to 1909.

Year.	No. of Eggs.	Value.	Average Price.
1856	117,230,600	£278,422	5/8
1858	134,085,000	303,617	5/5
1860	167,[illegible],400	478,658	6/11
1862	232,321,200	503,813	[illegible]/1
1864	335,298,240	835,028	5/11½
1866	438,878,880	1,105,653	6/0¾
1868	383,[illegible],040	1,009,285	6/3
1870	430,842,240	1,102,080	6/1½
1872	531,591,720	1,762,000	7/11¼
1874	680,552,280	2,433,134	8/7
1876	753,026,040	2,620,396	8/4
1878	783,714,720	2,511,096	7/8¼
1880	747,408,600	2,235,451	7/2
1882	811,922,400	2,385,263	7/1
1884	993,608,760	2,910,493	7/–
1886	1,035,171,000	2,884,063	6/8
1888	1,126,793,000	3,083,167	6/6
1890	1,234,950,000	3,428,806	6/8
1892	1,336,730,000	3,704,718	6/10
1894	1,425,236,000	3,[illegible],329	6/5
1896	1,589,401,000	4,184,656	6/4
1898	1,730,952,000	4,457,117	6/2
1900	2,025,820,560	5,406,141	6/5½
1902	2,271,661,560	6,308,985	6/7½
1904	2,393,111,280	6,730,574	6/9
1906	2,264,893,080	7,098,137	7/6¼
1908	2,185,208,400	7,183,112	7/10½
1909	2,125,252,920	7,235,302	8/2

The immense amount of this import trade is plain enough, as is also the startling fact that the number of eggs thus imported equals about 55 per head of the inhabitants of Great Britain (excluding Ireland from this figure, as being herself an exporting and not importing country). It is further evident that the values of such importations have grown more rapidly of late years; and it may seem natural to draw the conclusion that the foreigner is "ousting the British producer," so far at least as regards the market for eggs. The moral is often added, that the British producer is doing nothing, and is being to all appearance "hopelessly out-distanced" by the foreigner, owing as supposed to the latter's superior methods or the nature of his farming.

Natural as such conclusions may appear, they are in the main mistakes arising from ignorance. We remember a great statesman once declaring from his place in Parliament, how he had found in his experience that amongst all the different sorts of lies, the worst were statistics. In sober truth, the number of presumed authorities who are capable of truly judging figures and reading their real lessons, appears very small. In this case the foreigner is doing nothing of the kind, as can be readily shown. The first step towards drawing true conclusions about foreign imports is to analyse the gross figures themselves; and the following table gives the value during the six years, 1904-1909, from the five countries which supply the vast bulk of the trade; all other countries, apart from Italy, Austria-Hungary and Canada, amounting in 1909 to no more than £928,141, which we will deal with separately.

Analysis of Imports.

Year.	France.	Russia.	Denmark.	Germany.	Belgium.
	£	£	£	£	£
1904	710,057	2,042,520	1,461,459	1,191,161	837,120
1905	660,369	2,426,029	1,634,288	764,966	830,598
1906	623,119	2,344,256	1,701,291	957,[illegible]	[illegible]
1907	541,088	2,392,044	1,774,318	1,030,190	891,460
1908	535,249	2,518,051	1,824,273	855,256	884,686
1909	475,335	2,928,857	1,698,329	255,[illegible]	

NOTE.—The blank in Belgium for 1909 is due [illegible] value from this country was included in the official returns under "Other Countries."

All other countries till recently included Canada, and in 1891 amounted to £160,496.

In 1893 Canada was tabulated separately as £75,506, while in 1900 she sent to England £288,945, all other countries amounting to £465,787. The latter amount included chiefly, in 1899, America, Egypt, Spain, Portugal, Morocco, Holland. A very few cases came direct from Italy, but this country sends many more through Holland and Belgium, part of whose figures are therefore Italian. Russia also sends many through Germany, and a less number through Denmark, part of which should therefore be credited to her; she also exports a considerable number to Belgium; thus actual direct imports from Germany and Belgium are not so large as they appear on the surface, but on the other hand Russia looms still larger, as now by far the largest exporter of eggs to Great Britain. In 1909 the Board of Trade attempted to classify the imports according to their country of origin; but even now the returns are far from complete.

Prices and Quality.

These eggs from various countries are of very different qualities. Those from France are both nearer and more promptly collected, and realise the highest prices; those from Germany—many being Russian—are next to Russian lowest in price. In summer, Russian eggs average barely 5s. per "long hundred," while French even then approach 8s. Many Russian eggs are almost rotten when sold in this country, and are chiefly used in various manufactures, for which such eggs answer perfectly, or for the worst class of Italian confectionery. Calculating out from the declared values, the average price of foreign eggs per 120 comes out for the year 1909 thus: France, 9s. 0¾d.; Canada, 10s. 11d.; Italy, 9s. 1¾d.; Denmark, 9s. 6¾d.; Germany, 8s. 3¾d.; Russia, 7s. 2d.

There is yet a further fact to be noted in regard to prices. Those of foreign eggs, owing to these changes in source of origin, are somewhat lower than formerly. In 1872, when the bulk of imports were French, the average price of the year was nearly 8s.; in 1874, 8s. 7d.; and in 1876, 8s. 4d. It did not go below 7s. till after 1884, but in 1902 was 6s. 7½d. A large part of the better class eggs have thus been displaced by the staler and commoner Russian at a cheap rate, for purposes which these adequately fulfil. It is not to be expected that English producers should produce eggs at such a low cost as to compete with these; and as conditions of life improve even in Russia, it is likely that the cost may continue to rise. But it would be wrong to conclude, as some have done, that the foreigner has "ousted the Englishman" from the egg-market. There is no grain of evidence that one English egg the fewer has been sold owing to foreign competition. On the contrary, that the foreigner has merely stepped in so far as regards the better foreign qualities, where the home producer could not or would not supply the enormous demand, is shown by the facts that an all-English supply of good quality has of late found a better market at higher prices, and that home production has *increased prodigiously*.

Increase in Consumption.

Of that enormous increase there is not the slightest doubt. It is a disgrace to this country that since 1884 there was no attempt to give official poultry statistics until 1908, when a Poultry and Production Census was taken; but the result has not yet been published. In default of that, we have made many attempts to get at facts; but while all observers, with no solitary exception, agree in reporting an enormous increase in British poultry and eggs, they differ greatly as to the amount. None has estimated it under *twice* that of twenty years ago; more have said three or four times; some even more than that. The shops in all large towns tell the same tale. In all leading thoroughfares there are "dairy" and other shops where clean (generally tinted) British eggs are exposed for sale in neat dozen boxes at "new-laid" or "fresh" prices, and very good prices too, ranging up to 3s. per dozen in the winter months. Every cyclist knows how often he now gets really new-laid eggs about the country. All this is a recent growth, a new thing: such parcels of eggs at such prices were absolutely unknown when a former edition of this book was written. Thirty years ago, the vast majority of persons, as we then wrote, had never tasted a really new-laid egg, and did not know what it was like: now many thousands do, and are willing to pay for it.

New-Laid Eggs.

A more tangible fact of the same sort is that there is now a *London market* for "new-laid" eggs. And the following prices were paid per 120 for genuine new-laid eggs during each month of 1910: January, 16s. to 18s.; February and March, 10s. to 15s.; April, 9s. to 10s.; May, 8s. 6d. to 10s.; June, 9s. to 10s. 6d.; July, 9s. 6d. to 12s.; August, 10s. to 13s.; September, 11s. 6d. to 13s. 6d.; October, 11s. 6d. to 15s.; November, 16s. to 21s.; December, 17s. to 22s. The differences depended chiefly upon size and even sorting: if large and small were mixed, the lot only realised the price of small, while all large were worth more; colour also counts, brown eggs being worth more in England.

All these prices are above French prices, the winter ones far above them; and this market has grown up in face of all the foreign competition. We are told that the market is steadily growing, and that prices on the whole tend to increase rather than diminish, but that the greatest difficulty is to get *absolutely reliable* quality. Many of the early consigners of these eggs would hold them back, say in September, to get October prices, and worse. Very drastic measures had to be taken with some, and these practices cramp and check the demand and sale even now. It is essential, for a trade at "new-laid" prices to grow, that the eggs be sent regularly three times a week, or at the outside twice, and all new-laid since the last day of shipment down to date. Of course, such a market might be occasionally glutted, as any market can, by some accidental rush of supply but the steady market is *growing* for such goods, which can never be supplied by foreigners.

British Supply.

The general course of the egg trade will now be quite clear. It is beyond doubt that the demand for eggs as food in England has lately increased beyond all calculation, and beyond any prospect of home supply until quite recently. Cycling alone has done much; the growth of town populations has done more, as Mr. Edward Brown has repeatedly pointed out. The dietetic value of eggs is appreciated as it was not before, and the relish for such light food is extending. But meantime the British producer has not been standing still: he is selling many times more eggs than he ever did before, and yet getting better prices for them, not worse. Besides those sent to market, thousands are sent in smaller packages to private customers, and many leading railways now have special terms by which such produce can be sent up by passenger trains, provided it is packed in boxes which can be piled on each other. The Great Eastern Railway charges 4d. for 20 lbs., the Great Northern 6d. for 20 lbs, and 1s. for 50 lbs., from any station on their systems to London. The increase in the home egg-trade is simply incalculable; and it is obvious that, whilst this supply has been superseding the best and highest-priced of the French eggs, the Russian supply has been affecting the lower grades, but that in the main the home producer need have no fear of holding his own in face of the enormous demand for a good article, now really beginning to be appreciated.

There are still difficulties to be overcome. Eggs in summer fetch very low rates in many country districts, because thrown upon a bad market, and also because kept till stale. The egg once stored a week or more competes only with the foreign article, and summer is always the worst time to sell. There is also, unfortunately, no doubt that fraudulent dealers "candle" foreign eggs, and put them in as "new-laid British," thus not only cheating in price, but depraving the public taste, since the really "new-laid" British egg is *sui generis*. The most amazing fact of all is that producers themselves should act in the besotted fashion above mentioned. Even the lowered railway rates, however, leave something to be desired; and producers greatly need some such recognised price and system as enables the Surrey fowl to be collected, sent to London, and the packages returned to the sender at the definite net charge of one penny per bird. This is based upon the light, but strong, square crates called "pads," which are stacked solid upon each other from floor to roof of the van. These "pads" fill two vans thus packed, at Heathfield, three times a week in the season.

Organisation.

The National Poultry Organisation Society, whose offices are at 38, Queen Anne's Chambers, Dean Farrar Street, Westminster, London, was founded in 1898 with a view to get the home trade in poultry and eggs into a better business condition. It endeavours to establish local societies and collecting agencies for forwarding and marketing local products, and stamps the eggs sold under its auspices with its own trade mark, as a guarantee of freshness and quality, which shall at least prevent them from being mixed with foreign importations. Collection appears, upon the whole, to promise more success in England than such local markets as are common on the Continent, and should also transmit eggs more frequently, and therefore fresher; but in one or two localities, as in Dorset, there are general markets which are recognised and of considerable use.

The great need, and it is one that cannot be emphasised too often, is the necessity for scrupulous care by the producer in the collection of eggs for marketing, so as to avoid the slightest chance of a stale or doubtful egg being included in any consignment. Another point upon which stress must be laid is that of careful packing.

Results will much depend upon an adequate *winter* supply. Not only are prices much better from October till March, but London merchants give marked preference in summer also to producers from whom they receive their supply in winter, when wanted most: hence pullets have to be hatched all times of the year for an egg-farm. Even the very early ones, which lay from August till October or November and then moult, are useful in filling up the supply, and are often best killed directly moult comes on. March and April birds will fill the winter packages; and some late ones are often useful in the summer.

Modern results (first obtained in America) from the free use of clover and cut fresh bone have done much not only to revolutionise, but to systematise, the egg-farming of the present day. The free advice always available to poultry-keepers in the columns of the better-class poultry papers has also worked wonders in the direction of the proper feeding of fowls for egg production.

Cold Storage.

We have made special endeavours to ascertain what effect cold storage or freezing is having upon the trade in dead poultry and eggs. Storage of dead poultry has so far had some effect in *steadying* the market, as birds are often now placed in the cellars to hold over a day or two, instead of being absolutely sacrificed on days of too free supply. But it has to be remembered that with this the price goes down: once gone into storage, a bird has to be sold for 6d. or even 1s. less than if it was fresh. As most people know, animal food that has been frozen will not "keep" well, once it is brought out and thawed: it has passed from first-class to a lower grade, and has to be sold quickly and as such. In regard to eggs the risks are considerable, as mentioned a little further on; and they too must be soon used when once brought out. Eggs moreover require more careful adjustment of the temperature, for if too cold they burst or break the shells; they have to be kept at only about one degree below freezing-point. Lastly, we believe they can be detected by testing. A gentleman who markets many eggs, and was therefore personally interested, told us that a frozen egg could be known by completely filling the shell, without apparently *any* air-bubble at the end, and that, when boiled, the air thus diffused in freezing localised round the yolk, which it clearly separated from the white. We tried in vain to procure a few cold storage eggs for further testing this, there being none obtainable: but we took advantage of a mild frost to freeze some fair shop eggs, possessing quite a large air-bubble. The first assertion was perfectly true: *the air-bubble had totally vanished*, making the egg apparently "better" than new-laid. Of the second statement there remained more doubt, the frost having cracked the majority of the shells; in all cases, however, the definite air-bubble did not return, the air generally separating the white from the membrane over the greater part of the egg. It is satisfactory thus to find that cold storage eggs, however good they may be, cannot be permanently passed off as fresh.

Testing Storage Eggs

The figures relative to the imports of poultry into England during the years 1907-9 are as follows:—

	1907 £	1908 £	1909 £
Russia	277,799	360,362	351,918
France	181,042	170,587	150,085
Austria-Hungary ...	87,335	114,037	108,542
United States of America	203,588	152,135	140,552
Other Countries	153,183	136,758	154,002
Totals	£903,847	£934,679	£920,099

This trade does not at present very seriously threaten the British industry, as regards good quality. The cheap Russian fowls will be mentioned presently; of the better poultry, a large proportion consists of turkeys from France and Italy, many Italian turkeys being credited as from France and Belgium, for the December market. Poultry and turkeys from Canada have made a great advance of late, but can only compete as cold storage goods.

Ireland.

Ireland exports considerable quantities of both eggs and poultry to England, and this fact is obviously connected with the predominance in the country of small occupations, the vast majority of holdings being under 30 acres. The statistics show, however, that too small holdings are not favourable to either production or prosperity. Between the years 1841 and 1851 a great change passed over Ireland, holdings under five acres decreasing from 310,436 to 88,083, and those between 5 and 15 acres from 252,799 to 191,854, while those above 15 acres had correspondingly increased. Taking therefore 1851 as our starting-point, we find that in that year the number of poultry in Ireland was returned as 7,470,694. By 1889 the number had increased to 14,856,517, and in 1899 the number returned was 18,233,520, an increase of nearly 25 per cent.

Such figures must signify a steadily growing and, upon the whole, prosperous industry; and there is ample evidence that there has been very great improvement in many parts of Ireland, both as regards quality of the produce and prices realised. Writing in 1886, we had to report with regret that much good that had been previously done by poultry shows, and the distribution of better stock by owners of land, had been checked by the disturbed state of the country. These efforts have lately been resumed; and still more has been done by the Irish Agricultural Organisation Society (22, Lincoln Place, Dublin), which works by establishing local co-operative societies all over Ireland. These collect and forward produce, and diffuse sound information amongst their members, in which latter task they are aided by qualified teachers sent from the central body. Much of this work, of course, deals also with other branches of agriculture; but many local societies thus affiliated have chiefly to do with poultry matters. These (and the head organisation also) distribute plain and practical leaflets bearing upon the production of eggs and table poultry, and other details of the poultry industry. It is especially gratifying to observe the practical and trustworthy character of the teaching now thus disseminated, because at an earlier period the laudable efforts of the Congested Districts Board have been unfortunately much frustrated by the incompetence of advisers, destitute of practical knowledge, who have either selected unhealthy stock, or given advice in regard to stock from their own theoretical views, rather than such as suited the real requirements of the country. These practical leaflets, on the other hand, have taught Irish farmers to select the useful Asiatic crosses mentioned in Chapter VII., and described the points of table fowl, with the result that the export of live birds to Surrey and Sussex has largely increased, and prices been raised to within a few pence of the local Sussex standard. The raising of chickens for fattening is chiefly carried on in Wexford, Kilkenny, and Queen's County, from 2s. to 3s. each being often realised at the best season for Irish birds from 2½ lbs. to 4 lbs. weight: but co-operative societies are gradually opening the eyes of farmers in other districts to this profitable trade. A few societies are even encouraging fattening in Ireland itself, for the London and Liverpool markets, but the bulk of the export of spring chickens is of live birds through Kilkenny, as before stated.

In the Belfast district many fine fowls come to market at Lisburn, Saintfield, and other adjacent towns. These, as a rule, are well fed but not fatted, and, owing to the greater length of the journey, cannot compete in quality with Sussex birds, which get to London the night of the same day they are killed. Co-operation is however improving the packing, and consequently the condition and price of these birds. In large districts, however, there is even yet no regular market, and chickens can only be sold for 6d. to 9d. each to local customers. Such chickens are however small, killed as they run, and not perhaps worth very much more.

Irish Egg Trade.

The Society above referred to has, however, attained its most definite results in re-organising the Irish egg trade. Formerly the cottagers sold their eggs chiefly to women dealers, who usually added 4d. per 120 for collection to what they paid, on selling to the larger dealers, or to local shops, the latter chiefly paying for them in groceries. In either case the bulk of the eggs were generally a week to four weeks old when collected for actual export, and the eggs were often dirty, and of all sizes and sorts. A great deal of the Irish egg trade is still carried on in this way, which keeps these eggs at a lower price than good foreign. The Organisation Society engaged an expert from the export trade of Denmark, Mr. Viggo Schwartz, to instruct the local societies in the best Continental methods of sorting and packing; and we are glad to record that wherever the teaching of these has permeated, the people have been quick to seize it and understand its pecuniary value. The following account of the work that was done is by Mr. Viggo Schwartz, and will show the great improvement that was effected in this important branch of Irish industry:—

"It is only a few years ago that the egg trade was so much neglected in Ireland, and so ill-managed, that the Liverpool and Glasgow merchants began to threaten to refuse to buy any more Irish eggs unless the exporters would improve their parcels on lines similar to those which the foreign exporters had introduced. As, however, the merchants were unable to give any guarantee that better prices would be paid for fresher and cleaner eggs than had been hitherto paid, the farmers continued to send their produce to market as before. Very often the eggs arrived in a stale condition, packed in damp straw and most repellent cases, and such consignments were fast doing great harm to the Irish egg trade in general.

"It was at this juncture that the Irish Agricultural Organisation Society began to form local co-operative societies among Irish poultry-keepers, and to introduce amongst them better methods of carrying on their business. The Society's object is to infuse into the agricultural population of Ireland a spirit of self-reliance, and to show them how, by combination and mutual help, they could give effect to that spirit in a way calculated to better both the individual and the community. These local Poultry Societies are formed for the double purpose of improving the breeds and methods of rearing and fattening poultry, and improving the methods of placing poultry and eggs on the market. Poultry experts are employed to impart technical instruction, and amongst these I myself was brought from Denmark, especially to teach the Societies the Danish methods of selecting, grading, and packing eggs for exportation.

"A number of what may be termed Egg Societies are now in working order. The Sub-societies send the eggs collected during the week, or when eggs are plentiful every second day, to the exporting centre; these central stores are either at a seaport town, or some station on a main line of railway, from which there is good communication to the English markets. The local depôts, which are all within carting distance of the centre, receive the eggs from their members daily, by weight only, and none but perfectly fresh and perfectly clean eggs are received. The suppliers are paid cash for the number of pounds *weight* of eggs supplied, and not (as hitherto has been the way in Ireland) for the score or the dozen and paid in tea and sugar. Purchasing by weight has had the effect of making Irish poultry keepers much more ready to adopt the advice given them, and cultivate breeds which produce eggs of larger size and in greater number. The eggs are then placed in large cases with cardboard divisions, holding 1,000 eggs each, and so brought to the central packing station. As soon as received there, they are graded to their respective sizes, which range from 18 lbs. per 120 eggs down to 13 lbs., then tested carefully so as to detect any that may be bad, and finally packed in export cases.

"The packing cases are of Continental pattern, and are made in three sizes, namely, 'whole cases,' containing twelve long hundreds, or 1,440 eggs, 'half-cases,' containing six long hundreds, or 720 eggs, and 'quarter-cases,' to take 360 eggs. The whole cases are practically two half-cases, these being divided into two equal parts by two centre-pieces, in such a manner that by cutting the case between those centre-pieces there will be obtained two half-cases. The eggs are packed in these cases in layers, and each layer in rows of a certain number; not, as the custom has been in Ireland, pell-mell. Every case of whatever size contains four layers of eggs, and each layer in the six-hundred cases or half-cases, 180 eggs, arranged 18 eggs in a row, and ten rows; while the three-hundred cases or quarter-cases contain only 90 eggs in a layer, 9 in a row, and ten rows. The packing is done with such accuracy that the eggs on unpacking occupy the same position as they did when packed. To attain this a layer of wood-wool is placed between each two layers of eggs, and carefully arranged so that it is the same thickness both between the layers of eggs, and the eggs and the sides of case. Its quantity must be such that no empty space is left when the eggs are packed down. When the fourth and last layer is packed, this ought, before compression, to be on a level with the edges of the case. This layer is then also covered with wood-wool of about two inches thickness, and above again is laid a layer of dry, clean, and stiff straw. In order to press down the lid to its position the packer walks on it when nailing, and this can be done without breaking a single egg. If the top layer is on a level with the case edge, the proper pressure will generally be had on packing down, so that the eggs keep their position, but of course either too much pressure or too loose packing would cause breakages.

"This method of packing is new for Ireland, but has been used on the Continent for a great many years. Several experiments made in Denmark have shown that eggs packed in this manner and forwarded to London by steamer from Copenhagen to Newcastle, and thence by rail to London, have reached their destination without a single breakage. But this implies another matter of importance, viz. that both the steamship company's and the railway company's porters, as on other routes through which eggs are forwarded from the Continent to Great Britain, fully understand the handling of eggs. In this particular their colleagues in Ireland have still much to learn, and no packing, however good, can avoid breakages by careless transport. We hope, however, before long to get this important branch of Irish trade on a sound basis all round, and that it may rise to a height comparable with that in Denmark, where the egg export is now for the most part on co-operative lines, and one society I know has a yearly turn-over of more than £125,000 sterling.

"Some of the local Societies have, in order to prevent bad eggs being brought in, supplied each member with a stamp, bearing the number of the member and the letter of the Society. With this the supplier stamps all his eggs, and in this way it is possible to trace a bad egg to its source. A good many Societies have now been in working order for some time, and some of them—for instance, those at Athlone, Mallow, and Newmarket—are able to export weekly more than 150,000 eggs. No doubt this movement, which has already attained such striking results, will steadily enlarge as in Denmark, and the produce gradually find its way to the best markets, giving satisfaction to those who will help them by assisting their trade."

Besides the teaching of its chief egg-expert, and those trained by him, the Society distributes admirable leaflets on this subject also, stating the more suitable breeds and details of management, and pointing out in simple words that a good hen pays a profit of over 5s. per annum. The establishment of creameries is also helping the movement, and the collection of eggs; and thus by degrees, by the side of the old business at the old low prices, there is growing up a higher class Irish egg trade, which can command an average price of 10d. per dozen in the London market, equal to the very best of the foreign supplies.

Poultry in Ireland.

Another influence which improved the Irish industry was the increased number of winter shows of dead poultry and eggs, many of them established by the same local Societies as are referred to above. As a rule the Societies gave all their prizes in the shape of *live birds for stock;* in this way good blood was brought into the country, and in some cases the effect was wonderful. Mrs. F. C. Smith, of Boyle, wrote us that at the first show in Mullingar the heaviest turkey was only 11 lbs. weight; the second year the best was 24½ lbs.; and in 1898 there were over a hundred that weighed between 20 and 25 lbs. dressed, and cockerel chickens weighing 15 lbs. to 18½ lbs. per pair. Wherever these shows were got up, the effects were seen directly, and both eggs and fowls were of very different size and quality within a year or two. The birds exhibited are chiefly bought by Dublin poulterers and local private gentlemen at high prices for Christmas; this shows the Irish farmers *what good poultry will fetch,* and stimulates their ambition.

To the really practical poultry expert, perhaps the most significant change of all in Ireland, is seen in the choice of breeds. Years ago, many people had spread amongst the peasantry the most really desirable breeds; but all alike found that these rapidly disappeared, with the exception of Hamburghs and Leghorns. These pleased and were kept on, because they laid well, yet were small and ate little! That reason has been given to us personally in years past, even near Belfast, and we have heard of it from scores of independent sources; the people could not get better prices for larger eggs, and preferred the birds that cost the least. The purchase of eggs by weight, and selection of the largest by the creameries, and the demand for chickens from Sussex, and practical teaching brought *home* to them, are now changing this, and rapidly developing a valuable national industry.

France.

The production and consumption of eggs in France is undoubtedly very large, for which there are several obvious reasons, some of which are common to the other Latin countries. One is that these are *Roman Catholic* countries, in which eggs are the only extra-vegetable diet besides fish allowable on fast-days. There can be no doubt that this has had much to do with the creation of non-sitting, laying races all round the Mediterranean, and largely stimulated egg-production. Secondly, small occupations abound, and these are specially adapted for the general cultivation of poultry. Thirdly, butcher's meat is rare as an article of food, and much of what is used is old and tough; this turns the national palate to tender stews and *entrées*, favours the taste for succulent chicken, and increases the demand for it. Lastly, in France especially the women do much work on the small holdings, and poultry-keeping particularly suits their habits, and the general economy of the small farms. A paper by M. Lavergne, published forty years ago, stated that many farmers in the La Bresse and other districts made from their poultry at that date from £3 to £5 per acre of their occupation.

The cultivation of poultry is still extending in France, though it is difficult to say how much, many "official" French reports and figures being worthless. French Government statistics in 1885 made the export of eggs to England of only the value of £556,800, whereas it amounted to £1,507,099; and we remember another case in which the Government return of the value of poultry products in the three arondissements of Mantes, Dreux, and Nogent was only *one-tenth* of the municipal return the same year, for their three chief towns alone. The best authority we have been able to find is the result of the decennial inquiry made under M. Tisserand in 1892, through the prefects of the eighty-seven departments, and which are certainly more complete than the ordinary returns. Going back for thirty years, this report states the number of fowls in France in 1862 as 43,000,000, and in 1892 as having increased to 54,000,000, besides about 9,000,000 of ducks, turkeys, and other poultry. It is remarkable to find that, as in Sussex, this increase has been accompanied by an increase in the area under oats: while other cereals showed some decline, oats had increased from 8,209,971 acres in 1862 to 9,399,560 acres thirty years later.

Eggs being therefore collected in France from a large number of small occupations, what has given the export trade and Paris trade such a development is the fact that the collecting mechanism is so well organised and efficient. A gentleman in the trade, writing to the *Grocer*, has described it for the benefit of English producers. Every small town or large village has a weekly market, and to these the merchants of the district send their vans with market cases, and buy all that are offered; if bad eggs are brought, the delinquent is subject to a fine, and for a proved second offence may even be imprisoned! The eggs are brought just as they are in these cases to the central warehouse, where they are "candled," and next morning are sorted and packed, according to size, in boxes containing twelve "long hundreds." By evening train the same day they leave for the boat. Thus the eggs bought from the farmers on a Wednesday are packed on Thursday, catch the Friday boat, and are in London market the following Tuesday, and so of other days in the week. They are packed carefully with white rolled straw, in white deal cases, arriving in a nice, clean-looking, saleable condition.

The home consumption of eggs in France is also very great, and this has made the foreign trade so sensitive to prices and other factors. About 1866 Madame Millet Robinet calculated the consumption in Paris alone at 120 per head of its population; and as the late Mr. Gibson Richardson soon afterwards found that 6,000,000 eggs were sold weekly in the Paris markets, some of these being of low quality used in manufactures, the calculation must be pretty accurate for that time. In 1899 the Paris Municipal Council published a return, showing that the consumption per head the previous year had increased to 212 per head. The consumption in France for omelettes alone must be something enormous. This home demand, as we see presently in the case of America, keeps up prices for the better quality, and the large export to England was formerly replaced in part by a considerable import from Italy. This was greatly checked by tariff changes; and when prices in England somewhat decreased, owing to English producers beginning to skim the cream of the best market, as above described, a quantity of the French eggs found a better home market in Paris.

A large part of the French export of dead fowls to England is for the December, and especially the Christmas market, to which many turkeys are sent over; but the whole of this export is very little, as already shown, in comparison with the egg trade.

Belgium.

Of the Belgian trade, a considerable portion is of Italian eggs, merely sent through the country; but it is impossible to ascertain what proportion. Eggs are also shipped direct, but it is curious that many of these are laid by Italian fowls—what, in fact, we call Leghorns, imported from Italy in the summer, kept to lay for about twelve months, and then killed. The Belgian table fowl *par excellence* is the Coucou de Malines, of which a number reach London in December; but more dead poultry go from Belgium to Germany than to England. In Belgium the rearers of lean chickens chiefly meet the fatters at certain established markets, where the fatters buy what they want or can get, and take them away.

Russia.

The most remarkable growth in European poultry industry during the last twenty years is undoubtedly in Russia, where the Government has made considerable efforts to encourage this industry. In 1899 it held a great international exhibition at St. Petersburg for the purpose of making the people acquainted with foreign breeds, many of which, especially German and Belgian exhibits, were taken home by Russian buyers. There was a monthly *International Poultry Journal*, with departments in Russian, French, German and English, which must have been subsidised, or it could not have been carried on. The Grand Duke Nicholas stated a few years ago that poultry was recognised as the branch of production which had most rapidly advanced, and the export to England was only a portion of Russia's export trade. This is, of course, returned in roubles, and dividing these by ten (which is almost exactly correct) to give the figures in pounds sterling, the exports for 1898 (the last figures available) were:—

Description.	Value.
Live fowls	£637,000
Dead fowls	141,648
Dead game	6,131
Eggs	3,113,386
Yolk of egg	30,612
White of egg	3,542
Down and feathers	197,951
	£4,130,270

It is of course the vast southern districts of Russia which produce poultry and eggs, the producers being nearly all very small men, from whom their fowls and eggs are collected by travelling dealers or higglers. The birds have little attention and little food beyond what they pick up: hence the cost and prices realised are both very low. In the spring no more than

2s. 6d. a hundred is paid in Russia for eggs, and in summer they may go as low as 1s. 9d., but later they may go as high as 4s. 6d. to 4s. 9d. They are sorted through rings of different sizes, and also as to quality; and when packed in cases are carried by rail at almost incredibly low rates, on the Government railways, to Baltic ports. Vast numbers go to German markets as well as to England, and considerable quantities to Hamburgh, whence they are shipped to England as German eggs. Many other of these "German" eggs are Austro-Hungarian and Italian, and it is doubtful if Germany herself, except as a carrier, is a factor of much real importance in the British egg trade. The Russian egg supply itself can never be of very high quality, or seriously threaten that of really new-laid eggs. The distances are vast, the collection slow, the transhipments necessarily several. Hence the relative prices already noted. They must always be mainly of the cheaper grades.

The same applies to Russian dead poultry, which necessarily come frozen, and are subject to the depreciation of frozen carcases. They are shaped in cloths after plucking, the legs and wings being folded tightly in, so that the entire fowl is exactly the shape of a fir-cone; each is then tightly wrapped in thin paper and packed in a case holding 100 birds of uniform size. In April, 1899, we passed a very good class City restaurant, and noticed on the *menu* at the door, "Half spring chicken, roasted, with bacon, 1s." Though the hour was absurdly early, and the place nearly empty, we went in purposely to try what such a portion at such a price was like, and found it fully equal to any average, the half being, of course, of a small bird. We investigated further, to be met as usual with perfect courtesy, and found these chickens were Russian, bought that morning in the Central Market for 1s. 2d. per bird. We do not see how English birds are to be produced at such a price. On the other hand, they are almost entirely sold for a restaurant trade, neither their size nor their keeping qualities adapting them for sale by a poulterer to private customers.

As regards the imports of Danish eggs, there has, during the past year or two, been a shortage, and in the year 1909 Denmark sent to this country 359,407 great hundreds less eggs than in the previous twelve months, a decrease of 2·14 per cent. But the value of Danish eggs has continued to advance, and, taking the average value of foreign eggs imported into Great Britain during 1909, it will be found that Denmark, if Canadian eggs be omitted, comes highest with 9s. 6¾d. per great hundred. The genuine Danish trade has been organised on the same lines as the Irish trade, already described.

United States.

The most gigantic poultry industry in the world, at the end of the first decade of the twentieth century, is undoubtedly that of the United States. According to the census of 1880, the number of fowls in that year was 102,272,135, and in 1890 that number had increased to 286,000,000. The census returns for 1900 unfortunately give a very inadequate idea of the facts, only including fowls over three months old on June 1st, on agricultural farms. Owing to the climate this would include scarcely any of the chickens of the year, and the 250,681,673 birds, value 85,794,996 dollars, represent practically little more than the *farm breeding stock*. A better idea is given by a return of poultry products "raised" during the preceding year (1899). These were valued at 136,891,877 dollars for birds, and 144,286,186 dollars for eggs, or over £56,000,000 sterling. Yet this again is mainly *young* stock. Adding any lowest possible estimate for both deficiencies, and for smaller and city lots, it is clear that poultry exceeds in value either the wheat or the cotton industry, and is probably the largest single industry of the country!

Such figures necessarily denote an unparalleled consumption, the reasons for which have been already stated. New York State and City together are calculated to consume 45 million dollars in eggs and chickens annually, and in the city alone three to four millions of eggs are eaten every day. Eggs are used in all forms, by all people, almost universally. We get from America also the best idea, probably, of the extent to which eggs are used in trades and manufactures, which probably applies more or less to England also. It was calculated that 480 millions of eggs were consumed annually in calico printing, 120 millions in wine clarifying, and 240 millions in book-binding, glove-making, and other leather industries. It is remarkable that beside the enormous home product, there is quite a perceptible import of eggs from China, Mexico, and Japan, which is probably absorbed in these manufactures. There was formerly an import from Canada, but this trade was stopped by the McKinley tariff and diverted to England.

In connection with this enormous egg trade has grown up a system of cold storage, commencing in April and continuing till the winter. This tends to localise in a few centres, prominent ones being Kansas City and Chicago; but there has been considerable exaggeration about the extent of it and the commercial results. The eggs have to be very carefully candled, and the superintendent of this process at one Kansas City house, where eggs are cold-stored for Texas, Colorado, California, and others beside the home State, has from ten to thirty men under him according to the season. The overlooking of a single decayed egg may spoil a whole caseful, and a case with many very bad ones may spoil many others near it. Prices realised also differ much, according to the season; and from these various causes, several seasons the speculators have made serious losses. On the whole, however, storage helps to steady the market, raising prices in summer and moderating them in winter, when the stored eggs come out for use. Surplus imports into New York City are also stored there.

In connection with storage, a great many American eggs are canned, all eggs found with their shells broken or cracked being thus treated. The whites and yolks are separated, and then canned in the same way as meat or vegetables, the product being used by bakers and confectioners, who find the separate yolks or whites very convenient, and use a great many cans in winter when eggs are dear. Good eggs are also canned and exported for use in hot countries. The eggs rejected for storage because cloudy, or even rotten, are also canned, and sold to be used in the above-mentioned manufactures. Egg-shells are broken up small and sold for various purposes, sometimes as a fertiliser.

It is unnecessary to dwell at any length on the marked differences between British and American table poultry. The chief point about the latter is that the birds are not *crammed*, but simply *fed*. Yet many of the larger ones of the best quality, known as "soft" roasters (*i.e.* the flesh tender, not hard), are really of very fine quality, and raise a very interesting question for British producers. The latter, as already seen, depend chiefly upon cramming with semi-liquid food, without fresh vegetables, but with sour milk. Americans simply feed, with large rations of cut clover in addition to grain and mash and animal food; and this clover feed, as before remarked, seems to maintain appetite, cool the system, and enable it to digest large quantities of the more solid food. The question is well worth study and experiment in this country, of how this system of feeding would answer in comparison with the other.

Besides the roasters and broilers already treated of, however, a half or quarter of one of the latter being served to each person, there has been, since 1898, a new American development in the shape of "squab" broilers, weighing only from three-quarters of a pound to a pound each, and sold wholesale at from 1 to 1¾ dollars per pair. Wyandottes and other medium-sized breeds make the best of these. They have originated in a desire for some *new* poultry dish amongst the wealthier classes in the large cities, and the trade is confined to this class. In size these small birds closely resemble the *petits poussins*, which have been already described; but they are quite different in texture, and served quite differently, being split down the back and broiled just like their larger brethren; the only difference is that a whole bird, instead of half or quarter, is served to each person. They have to be very uniform in size, which varies a little in different cities; as it would cause comment among hotel guests if some were served differently from others.

Canada.

In the former edition of this work, reference was made to the import of eggs from Canada, and attention was directed to the prices obtained for Canadian fowls, which were, of course, sent over in cold storage. It was remarked that the industry was increasing in Canada, and that it was being encouraged by special instruction given under Government auspices in various ways; but there was no data then available for stating the probable outlook or immediate prospects of either the industry itself or the Canadian-British trade. For some time subsequently large quantities of Canadian eggs continued to reach the English markets, and apparently the Dominion was destined to rank as one of our chief sources of supply. To-day Canadian eggs are practically a negligible quantity, and are rapidly approaching the point when they will cease to be tabulated in the Board of Trade returns. In 1909 only a little short of £2,000 worth of British North American eggs reached Great Britain.

In his excellent report on the Poultry Industry in America, Mr. Edward Brown, hon. secretary of the National Poultry Organisation Society, by whom the book is published, explains this great decrease as follows: "The explanation has already been given, namely, that home demand and enhanced local prices have made the trade unprofitable; another factor, as expressed to me by leading shippers in Montreal and Toronto, is that it is entirely a question of price, and if they can sell upon the spot it pays much better than sending long distances, with all the risks involved therein. The standard of quality upon the British markets is distinctly higher than either in Canada or the United States, and, as a consequence, grading of eggs for England has to be carried out very strictly indeed. In addition, strong complaints were made as to the English system of selling on commission, which had proved very unsatisfactory. One merchant told me that he did not think, even when the Canadian supplies had overtaken the trade, they would go into it again to any extent unless they can have their own representative on this side. I have no means of determining how far these complaints are justified, but such were the statements made."

Australia.

Australia also sends a certain amount of dead poultry to England, and shipments have been made of cold storage eggs, but the latter trade is of little account. It would have the advantage of opposite seasons, sending off eggs when most plentiful, to arrive when most scarce—but the risks and uncertainties of the business have been already mentioned. Poultry-farming is quite a recognised industry in several parts of Australia; one very marked area being the shores of Botany Bay, a few miles from Sydney. Here as much rent is charged for a few acres of poor land and a wooden shanty as for an equal holding and decent cottage in England, the competition is so great; three to twenty acres being the usual size of the holdings, and the produce being sent in by cart to Sydney, where the dead poultry are often sold *by auction*. It is significant that whereas the Sydney Labour Bureau had for several years previously reported poultry-men as wanting engagements, in the annual return issued June, 1900, no person professing such an occupation was registered as out of employ. Some of those Botany Bay farms produce chiefly ducklings, for which a Muscovy cross is largely used, others chickens, others eggs; and stock birds to improve stock have been largely imported during late years.

So far (*see* table, page 137) dead poultry has chiefly been sent from West Australia; but Sydney is actively moving in the same direction; and the only definite figures we have are from that quarter. The expenses of shipping, commission, etc., are found to amount to about 10d. per bird.

The latest development of the Australian industry is a recent, and so far rapidly increasing, export of dead poultry to South Africa.

General Conclusions.

Taking a general view of the whole trade, there is nothing to discourage the home producer who can send to market the better qualities of either poultry or eggs. The very fact of distance prevents any foreign produce from being first-class, and the British public are becoming better educated to the higher value of first-class. If attempt be made to fight the question of distance by cold storage, up to the present price, and quality also, suffers. For cheaper grades the outlook is less promising; and so far as these satisfy a public of their own, we are not clear that British growers can compete at a profit any more than in growing other things. The producer must aim at the best, and at getting it to market in the best condition; and just as our splendid English hot-house grapes are beginning even to be exported to the Continent, so new-laid English eggs and the best English poultry will, we believe, find a paying market even during the present century.

CHAPTER X.

EXHIBITION POULTRY AND UTILITY.

BEFORE entering into the practical details of breeding poultry in accordance with recognised exhibition standards, we must consider with some care the question as to the good or evil effects of such pursuits, of such standards, and of the poultry fancy itself, and all connected with it. That question has been more or less debated for many years; but of late attacks upon the whole system of poultry exhibition have been so repeated and carried to such an extreme, as really to put poultry breeders upon their defence, and make it necessary to see what amount of truth, or how much of error, there may really be in the sweeping charges brought against them.

Early Attacks on Fancy Poultry.

The controversy is no new one. So long ago as 1872, the Hon. J. Stanton Gould, an eminent American stock-breeder, in addressing the newly formed New York State Poultry Society, complained that the standards "tell us nothing about the physiological condition of the birds, nothing about their capacity for laying on flesh, nothing about their capacity for laying eggs, nothing about their powers of digestion and assimilation, nothing about their hardihood." He more definitely proceeded: "In the rules for judging Brahmas, I am told the beak must be well curved. I would respectfully ask, Why? . . . I read further in the same standard of excellence that the Brahma must have a pea-comb. . . . But why, in the name of common-sense, is it necessary that a Brahma should have a pea-comb? If it is true that the pea-comb is no indication of the excellence of a fowl, or of its profitableness, or of its purity of blood, and if it does not minister to the æsthetic gratification of the owner, is it not simple nonsense to include it among the points of excellence of the breed?" The speaker intimated that "there can be no real advance in poultry breeding until it is removed from the realms of caprice and fancy, and placed upon the sure foundations of anatomical and physiological science."

What the "Points" really are.

That crude stage of the discussion is now almost a thing of the past. It is understood, by all who have studied these questions to any purpose, that supposing for the sake of argument a Brahma really is of more value than some mongrel or scrub race of fowls —and an unspoilt Brahma certainly is so—if it is to be preserved at all as a race, it must at least be described as such from characteristic and true specimens, or you cannot distinguish it, as a race, from others. But thus the pea-comb or other points *are* indications of its "purity of blood." In the main, they are the stamps of the race as such; while the curious clause about the point not "ministering to the æsthetic gratification of the owner" simply baffles a fancier's understanding, except on the supposition that this was Mr. Gould's first real acquaintance with poultry breeders. So, also, it is now seen that if a race celebrated for laying on flesh is properly described, its standard of form does tell us something about its "capacity" for so doing; or if a good laying breed be also accurately described in regard to form, and there be any indication at all in outward form of laying capacity, we have, so far, some indication of that too. And thirdly, it is now still further understood that these are the only kind of indications which we *can* have to decide between fowls in show competition, from the very nature of the case. When Mr. Gould asks why they are not judged by their actual capacity for laying eggs, the simple reply is that it could not be done. That is a matter of experience, or of testimony, which we cannot bring to the show-pen at all. There we are confined to something we can *see before us*, to outward features of some kind. The actual laying power can only be tested in other ways, as a poultry organisation is now endeavouring to test them in manner to be presently described. But in the pens we are shut up to outward, visible points, just as in a cattle show or a pig show. These should be, as already said, described from good characteristic specimens of any animal it is desired to cultivate; and when once so described and fixed, it is a mere abuse of terms to call them arbitrary; they are laid down *because found in characteristic examples of the breed*, and distinguishing it from other breeds or from mongrels.

Sir H. Thompson on Prize Poultry.

In 1885 much more direct attack was made upon exhibition poultry by a man famed throughout the civilised world as the premier surgeon of England—Sir Henry Thompson, also well known as a writer upon dietetic questions. In two long letters he relates how he had begun to breed Brahmas in 1881, erecting one of the most elaborate yards for the purpose ever designed; but sold off the whole in the summer of 1884. In taking up the pursuit, he said, he "naturally concluded that the most perfect birds were either those best adapted for the table and the most welcome when served there, or those which produced the largest number of the finest and richest eggs for the same purpose. For what other purpose were poultry wanted if not for these?" But he very soon discovered, he proceeds, that however it might be in France, in England the object was merely "feathers," and that, *as a consequence*, "we produce races inferior to those of France, cannot supply the moderate wants of our population, and pay enormous sums every year for the poultry and eggs of that country." To leave no possible doubt of his meaning, after again recounting how prizes are awarded according to the development of arbitrary characteristics, he repeats, "*Hence* our inferiority to France in the quality and abundance of poultry products," and even traces the effect of the "baneful system" to the farm and cottage, alleging the deterioration of "even the farmyard mongrels" by the cockerel purchased from some celebrated source. Finally, he pronounces that "no compromise is possible" between the two ends, of competitive breeding, and economic objects: for "either infallibly neutralises the other," and so nothing can be done really to improve poultry production "until the prize feather system is swept away."

This language naturally aroused considerable attention. Those who moved in poultry show circles at the time (for this cult has its peculiar "society" like every other) and who knew details not known to the general public; who knew something of the sources and cost of Sir Henry's stock, and the results of his "breeding," of the expenses of the establishment as carried on, and the respective shares taken by owner and "man" therein; and who could intelligently compare the objects here alleged with the elaborate plan of the yard he had built, smiled and shrugged their shoulders when they read this tirade. We have nothing to do with such matters here; and what is, in some measure, true in the charges thus brought against poultry breeders may be best considered after citing the more detailed statements of Mr. Tegetmeier. At the moment we have simply to say that Sir Henry Thompson's assertions betray in themselves a misunderstanding of the whole subject, and a consequent mis-statement of simple facts, which disqualifies him as an authority. Every one of the broader statements is simply a mere error—a mistake as to fact. It has been already shown that quite other causes than those alleged govern the exportation of eggs from foreign countries to this, and that those from France have, since he wrote, greatly *declined* to far below their former proportion, and to a small proportion of the whole; while on the other hand English production has enormously increased, and is still rapidly increasing. It is equally an error to say that from the alleged (or any other) causes we "produce races inferior to those of France." Fanciers have some races, it is true, which are so (and which are also kept in France); but our races which are meant for eggs and flesh are as good as any in the world, and one of the most celebrated French feeders—Madame Ailleroit—informed us personally, after looking over the exhibition Dorkings at the Crystal Palace, that they were "Perfection!" and that she would desire no better fowls to work upon. If again it is complained that English feeders do not equal the best productions of the French feeders, one is constrained to ask how they should do so, *in default of French prices*. In Paris there is a demand for the choicest fatted poultry at from 12s. to 25s. each; where and what is the demand for such in England? When such prices have been obtainable, we have seen in Chapter VII. that the fowls can be produced, and are equal, if not superior, to any in the world. The neglect of such considerations as these proves that a man may be pre-eminent as a surgeon, and yet be an exceedingly poor authority upon food economics; and it is the more to be regretted because the same failure to grasp the conditions leads Sir Henry Thompson to deny even the possibility of amendment, which is, on the contrary, quite practicable under exhibition "conditions" if exhibitors can only be persuaded of its necessity, which they are little likely to be by such extreme methods. These also tend to obscure the amount of truth which does really lie in such indictments, and which it is desirable to ascertain and recognise with a view to that amendment.

Errors in these Statements.

We shall be helped in this by the later and

Mr. Tegetmeier's Attack.

more detailed accusations made by Mr. W. B. Tegetmeier, in *Poultry for the Table and Market versus Fancy Fowls.** The author of this work was, as he states, a poultry judge at exhibitions for over a third of a century, and it is remarkable that his statements should be the most extreme of all. He writes: "I do not hesitate to affirm, as the result of my experience of half a century, that no one breed of fowls has been taken in hand by the fancier that has not been seriously depreciated as a useful variety of poultry"; and again, "Our agricultural societies are doing what I conceive to be considerable injury by giving prizes for useless birds," giving as the reason that "fancy points only have to be considered by the judges." He then proceeds to prove these statements, as he considers, by comparing the fowls of forty years ago with the same varieties as seen to-day. These details it is which are chiefly valuable, as showing the measure of truth and that of error, in regard to both his facts and his conclusions.

Fancy Points originally Utility Points.

Two important but common mistakes fundamental to all this should first be mentioned. They were both brought into relief at the National Poultry Conference held at Reading in July, 1899, in an able paper by the late Mr. O. E. Cresswell, upon "Exhibition Poultry and Its Influence on the Poultry Industry of the Country," and the discussion which followed. The first of them is to suppose that the "exhibited" races of fowls have any distinction from other and non-exhibited races; they are simply the *best* of the same, from a certain exhibition point of view. The second error, and more important by far, touches the statement that the cause of all the evils alleged lies in judging by "*fancy points only*." As Mr. Cresswell clearly brought out, these points, now called "fancy only," were most of them originally adopted because characterising the best specimens of the races, and *believed to represent some useful quality*, or to be connected with it.

Illustrated in Cochins.

This may be illustrated from Mr. Tegetmeier's own pages, in one of the most extreme cases, wherein we have frankly to admit that a breed once useful as a layer, and even as a chicken, really has been utterly spoilt as a useful fowl—that of the Cochin. The first show we took any personal interest in was during the Crimean War—hence probably in 1855—and our first buff Cochin chickens were hatched the following year. Mr. Tegetmeier's drawing quite fairly represents these, much closer feathered and less massive-looking than those of the present day, with, of course, far less shank-feather; and we can remember distinctly that the flesh was quite, and the skin very nearly, white. We also remember the birds as good layers. As Mr. Tegetmeier quite truly says, "Cochins, as at present exhibited, are a mass of useless feathers."† There could be no stronger case, and yet it can be shown that if the fancier has erred, he did so from good motives in the first place. In Mr. Tegetmeier's own *Poultry Book* of 1866, the late Mr. Hewitt writes upon the earliest Cochins as follows:—

> The reason why some Cochins lay so much better than others is that those which most abound with "fluff," as it is termed, or downy covering towards the roots of the feathers, are comparatively less influenced by sudden changes in the atmosphere, and consequently their laying is unimpeded. I have noted, as a rule without exception, that diminution of plumage and a scanty, "weedy" build is always accompanied with proportionate decrease in the number of eggs produced. I am confirmed in this opinion from the fact that the best layers of Cochin fowls I ever yet met with were white, a colour generally reputed by those who keep any kind of live stock as being the most weakly in constitution. They were the fowls with which I obtained first prize at the Birmingham Exhibition of 1853. They were most extraordinary fowls as to the superabundance of "fluff."

We know now that this was wrong; that Mr. Hewitt generalised too hastily from insufficient facts; and that tight plumage really goes with free layers, loose and flossy feather with poor laying and coarse skin. But fanciers did not know it then; they sought the mass of fluffy feather as a point really good and useful, and Mr. Tegetmeier himself, in a work the most influential of all others for years prior to 1872, helped to spread the error. His responsibility goes, indeed, much farther than this. He was not only acting as a judge for many years, but so acting at a period when, as shown in Chap. XIV., individual judges had far more power in deciding type than any of them possess now. He was, in addition, actually the editor and superintendent of the first *Standard of Excellence*, which, as further indicated in the chapter just referred to, was the precursor and foundation of its successors. As these earlier errors were discovered, considerable responsibility therefore rested upon him to direct judging into more correct lines. We have repeatedly endeavoured to do so from the first.

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* Horace Cox, *Field* Office. This work was first published in 1892. We cite from the third edition, published in 1898.

† He adds a very interesting explanation, which would never have occurred to us, that as feathers consist of nearly dry nitrogenous matter, while flesh consists of such matter combined with, say, three parts water (see Analyses, p. 33), it costs as much in food to produce 1 lb. of feathers as 4 lbs. of meat, and all wasted in moult annually.

according to any insight permitted us,[*] and it is in this way only that remedy can be found ; but we can remember no instance in which Mr. Tegetmeier, previous to these wholesale attacks, had done anything in actual detail to remedy mistakes, in stereotyping which he had such a considerable share.

Exaggerated Combs.

The same general truth about "fancy" points may be illustrated from another—the exaggerated combs so prevalent in Minorcas, Spanish, and Leghorns, which, in a majority of cases, involves either whole or partial sterility in breeding males, and impairs health and laying in the females. This is known now, and there is no longer "mystery" about it, as some fanciers seem to think. The hen or pullet is practically blinded on one side, and in both sexes the weight is too great for the brain, causing brain-fatigue, and often headache, which exhausts the nervous energy and so impairs the sexual vigour. But most of the special laying breeds have large combs, and it was believed by all the old fanciers, and is still thought by many, that to breed for the largest combs was to breed for the best layers also ; this opinion came out very strongly in a discussion on the subject in 1899. The point was, therefore, not a "mere fancy" one to the early breeders : they regarded it as a "utility" point ; and it was they, not present breeders, who gave that shape and bias to the standards originally, from good motives. Before Minorcas were an exhibition variety, we have seen combs on some as large as any seen now. In spite of all these things, however, Mr. Edward Brown once distinctly stated,[†] as the result of many observations and inquiries, that in consequence of the improved stock on English farms, obtained from the "fanciers" in every case, the laying average on British farms generally had increased between the years 1890 and 1900 to the extent of at least twenty eggs per annum for each fowl.

The Case of Dorkings.

The want of basis for such indiscriminate censures is well shown in Mr. Tegetmeier's statements about Dorkings. These, he maintains, were spoilt by Mr. Douglas crossing them with a Malay cock, causing coarseness and "loss of table qualities." The Cuckoo, he says, was one of the best and earliest to fatten, but went "out of fashion" for various reasons ; the extra toe, supposed to be an indispensable characteristic, is a mere deformity and a "considerable drawback from a utilitarian point of view" ; and the Silver Greys, by breeding for feather, "have lost the hardihood and plumpness they originally derived from the Game." Finally he quotes Mr. Cresswell (in 1881) as witness to the "long legs, dark feet, want of breast, and other defects which have long been the trouble of the real Dorking fancier." It so happens that Mr. Cresswell himself, in the paper above referred to, mentions the Dorking specifically as a breed which has been, beyond doubt, much *improved* by many years of breeding for exhibition, and at the Reading Poultry Conference in 1907 he reiterated that statement ! He has seen both Whites and Silver Greys developed from poor layers into excellent ones, and from delicate birds into hardy ones, under his own breeding, whilst at the same time he was improving colour ; this same whiteness of colour being shown, by his experience, to be a sign of freedom from tendencies to liver disease. These two are the specially "fancy" varieties of the Dorking, if any. On the grey or coloured we have already quoted Madame Ailleroit, and could cite any number more, that better fowls for the table never existed, if properly reared[‡] ; and the "fancy" extra toe, so far from being the work of exhibitors, comes down to us, and is described as a mark of the "best" fowls, from the days of the Roman Columella ! It was the "fanciers" who cried out against dark and long shanks, and brought back short legs and white feet as "points" to be insisted upon ; but these faults were not produced by Mr. Douglas's cross, not occurring till many years after that ; while the cross itself was not a Malay, but a bird from India of the Dorking type in all but the extra toe—probably a cross between an English Dorking and some local fowl of the Chittagong kind. Lastly, the Cuckoo variety is a good witness. We never heard of a class for it but thrice in thirty years' experience, and it has never been taken up by fanciers at all ; it ought to be the best, therefore, according to all this reasoning. On the direct contrary, just because it has lacked the support and stimulus of exhibition, it is the poorest and most backward, and difficult even to find.

The Cuckoo Dorking, and its fate without the fancier's help, also brings out well the great service of exhibitions and breeders : They have *preserved breeds* and made them known. The

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[*] Thus, we had protested against the disastrous changes in English Brahmas, and against the awards that produced them, years before any one else drew attention to the subject.

[†] *Journal Royal Agricultural Society*, December, 1900.

[‡] On the other hand, it is remarkable to find it stated in Wingfield and Johnson's *Poultry Book* of 1853, of Dorkings, that "as bad specimens of that family as of any other have presented themselves in every guise at our repasts." They were not all good fowls even then !

Game affords another illustration of this. What Mr. Tegetmeier alleges about the transformation of the old Game fowl into a stilty and useless breed, is unfortunately too correct; we have for years attempted to enforce lessons of this kind, and have no debate with any well-founded attempts on these lines. But when he wrote, in 1892, advising the use of Old English Game instead, as a cross for the table, he was obliged to say that these must be sought in cock-fighting districts, and that a cross was hardly ever seen. That is not so now. The "fanciers" since then have reverted to a new love of the old type; they have taken it up and exhibited it, and bred it largely. The consequence is that, as we write to-day, the breed can be obtained easily from many sources, and is accordingly *extensively used* now as a cross, which it was not before. So again, Mr. Tegetmeier recommends Indian Game for crossing. That breed has been preserved, and even made, by breeders for exhibition, and it is from them it is now obtained. He gives a figure of a hen "of good form," but which he declares, upon the authority of the late Mr. Nichols, would now be objected to by "fanciers" as being "too prominent in the breast and not sufficiently feathered in the neck." It is only needful to state that the figure is one of an *exhibition* hen, as drawn by Mr. Ludlow, and of the very same type as in our plate to-day.

Preservation of Breeds by Fanciers.

It is unnecessary to set out in full detail the similar mixture of truth and error which attends the same writer's remarks upon other breeds. It is but too true that the Brahma has been spoilt; not, indeed, by breeding to a standard, but by breeding to the *wrong* standard of the Cochin. It is true that the Spanish fowl is now practically useless, but this has not come about by breeding for white face. The Spanish stood that for many years, and so long as the Bristol breeders held together, and Lane, and Parsley, and Roué, and Jones, and Hyde were able to *exchange blood*, as they constantly did, it did not seem to lose its laying powers much, though delicate from confinement, and though the faces were then better than any seen lately. But at last one invented the comb-cage, which encouraged still larger combs than before. With that came sterility (and, of course, want of vigour in hatched eggs as well), the cause of which was not then understood; and finally, when the Bristol phalanx and their stock were all dispersed, single breeders of less experience, and with no change of blood handy, rapidly lost ground. Again, the large comb of the Redcap is mentioned as "useless waste," due to fanciers; whereas the fact is that the Redcap has never "taken" as a show fowl at all, and its comb is generally believed, by those who keep it for its useful qualities, to be associated with its enormous laying powers. It is affirmed that "the size and good qualities of the Houdan have been greatly lessened." In real fact, it is doubtful if the breed ever really took kindly to this climate; but those still kept are mostly good layers, and at all events are, beyond dispute, far *larger* than when imported. The Wyandotte is pronounced "valueless," whereas it is a most admirable layer, and when well fed a good market fowl. But it is needless to go farther in this direction, the more so as we have admitted that if there be considerable error, there is also in details too much truth. It is more needful to see the fundamental error; to see why, instead of seeking practical remedies, so many fly off into vague and wholesale condemnation which can bear no fruit.

The Charges Based on a Grave Error.

This was well brought out in Mr. Cresswell's paper, already twice referred to. Mr. Tegetmeier throughout assumes that in the early days of shows the fowls of the country were in all useful respects better than now, and that without shows and the fanciers they would have remained so. All that is known points the other way. A vast mass of evidence goes to prove that poultry are far more abundant and of higher *average* quality than they were fifty years ago; and there is every ground to fear that without the zeal of the fanciers the breeds themselves would have been utterly lost in mongrelism. None but fanciers (and, in the case of Game fowls, cock-fighters) have ever kept them up. As Mr. Cresswell ably pointed out, locomotion has broken down old limits; and the old pride of districts in their own special products has given place to cosmopolitanism; and all the rage amongst farmers and feeders lately has been for crosses, and "new" breeds made by crossing. Everyone acquainted with country and cottage life knows how true this is; and owing to such and analogous causes, the varieties not preserved by fanciers have nearly or quite disappeared. It has been so with the Cuckoo Dorking just mentioned; it was so with the Old English Game, until the "fanciers" took up the breed again; it has been so with the old grey-speckled and with the red Dorkings. There has been nothing in the world to prevent farmers and market breeders from breeding and keeping up, in their own way, these and other varieties alleged to be so much better; nay, if there really is the necessary antagonism here alleged between them and the fancier, it was their proper business to do it from first to last, and not his at all. *But they have not done it, while he has;* not without errors and mistakes, as we have seen, and as his bitter accuser does well to point out, but still he has done it, and it is his work entirely. We may cite as a crucial witness the Surrey fowl, which Mr. Tegetmeier himself cites again and again, especially complaining that the Royal Agricultural Society offers hundreds of pounds in prizes to "fancy poultry," whilst "the Surrey and Sussex fowls, which constitute nine-tenths of the very best and most remunerative birds coming to the London market, were absolutely excluded from competition." The fact is, as shown at length in an earlier chapter, that the old so-called "Surrey fowl" as known in the 'sixties has almost disappeared in the fattening districts; that at several shows within our recollection the "fanciers" have actually given classes for it, from a desire to encourage it, but there have either been no entries, or nearly all have been mongrels with no Surrey blood apparent in them; that at the Smithfield Shows of dead poultry, crosses between the pure breeds which the fancier has provided have been the finest specimens, while amongst those actually exhibited as Surrey fowls, most of the very best have been not really Surrey at all, in the sense of the old breed, but the identical feather-legged crosses which are being so industriously condemned. So far from supplying London markets, it is not too much to say that unless exhibitors can be induced not only to again give classes for it (already tried in vain) but also themselves to take it up and exhibit it, the genuine old Surrey fowl will soon be a thing of the past.

The Surrey Fowl.

There is another point, always forgotten by those who bring these wholesale accusations, and make such comparisons between the present and the past. That is, the *difference in markets*. In the old days demand and supply were small; now they are enormous, and the great mass of both is for a cheap product, of necessarily inferior quality. As already hinted, there is no market practically for fowls at the best French prices; it is not therefore reasonable to expect, at far lower figure, equal birds. But going back only to 1865, in that year we personally heard the late Mr. John Baily, whose authority is well known, state at a dinner that the price then and for years past commanded by good early spring Surrey chickens was "*four guineas per dozen*," or 7s. each. The supply was small, the breed was still to be had for it, and the price sure, and relatively equal to at least 9s. each now. That price will still obtain as good birds—nay, a less price will do so, and in far larger quantities than would have been possible formerly. Such is the work exhibitions have done. But it is not reasonable, when meat is 60 per cent. dearer than then, to expect that chickens, meant to be sold for very much lower prices, should equal such as Mr. Baily spoke of. At the Smithfield Table Poultry Shows, however, we have seen many pairs of fatted fowls at 14s. per couple—the same price; and one of the foremost West End poulterers told us that no better fowls, if as good, could ever have been found.

Difference in the Market.

We have discussed this question in some detail, because it is an important one in itself, and also because there really are serious points for concern in connection with it. If it is matter for regret that a veteran judge should have shown so much want of moderation in discussing it, it is not matter for regret that he should have raised it; and even his method may perhaps enforce its consideration as more moderate treatment might not have done. The practical issue is to find remedies for so much as admits of remedy. It is easy to say that none is possible; but the contrary is known by experience. We have shown that points now proved injurious, were first adopted as utility points; it is not impossible, if general opinion can be carried along with the change, so to modify the standards as to remove most of the evils now found. Beyond a certain point we cannot of course go. The best show specimen can rarely be the best layer; for it must be judged by the outward, while laying is an unseen and unknown point so far as showing is concerned. If careless in-breeding does impair constitution, that too we cannot check in a show pen; we can only teach methods, as in the next chapter, by which such evils may be avoided. But all these problems need not trouble us much, since the farmer and the feeder mainly prefer crosses, for many reasons, and in the first cross most of these evils disappear; moreover, we aim also to teach *him* how to breed fowls upon his own utility lines, from the stock the fancier provides. After you have scoffed at the latter to your heart's content, and though his very best show specimens may not be good layers, possibly—some of them are—we shall still find in practice that *the fancier is getting eggs* when the farmer gets hardly any, and that the fowls he kills for his own table are better than most which are bought in the shops.

Practical Remedies.

But yet it is desirable, and it is certainly possible, to modify *points in a standard* which are now known to have a bad effect. Let us briefly summarise the chief:—

Desirable Changes.

1. A superabundance of loose plumage is now known to cause poor laying and coarse skin; and excessive leg-feather and vulture-hocks have proved correlative with deficiency of breast. Effort would probably be now wasted upon the Cochin, which can no longer be considered a utility fowl; but attempt should certainly be made so to alter the standard as to restore and encourage tight plumage, moderate feather, absence of hocks, and length of body as points in the Brahma.

2. Excessive comb is now known to be directly injuring all the Mediterranean races, so far as England is concerned. It has been deplored by every standard writer upon Leghorns, and several upon Minorcas and Andalusians and Anconas, and compels breeders to dub many of their breeding males. It could easily be checked by setting a limit, and deducting points for excess beyond. Being convinced that many sketches of these birds, by artists, really exceeded Nature, and thus increased the evil by setting a pattern beyond the birds themselves, we asked one of the stewards of the London Dairy Show for 1899 to withdraw for us four prize-winners of the Minorcas and largest-combed Leghorns. Adopting as a standard measure the distance from centre of eye to point of beak in each bird, we found that only one of the four birds reached *twice* that distance, from centre of eye to the top of the tallest spike in the comb; all the others had something to spare within that measure, which will cover nine-tenths of all present prize-winners, though we see drawings which measure two and a quarter times, and even two and a half. It would be perfectly easy to define that no comb should exceed the twice, in vertical height, and that for any more, points should be deducted. Leghorns would be better set at rather less than twice; but we would dread violent changes, and trust to the steady influence of the penalised points for excess. This would affect hardly a bird of to-day, and yet certainly act gently and steadily towards diminishing the comb.

3. All breeds of fowl specially valuable for the table, and turkeys, would be the better for points in the standard being deducted for want of *length in the breast-bone*. To increase this is almost the chief point wanted in many table fowls, as we have found them at exhibitions during the last few years.

We do not think that such moderate changes as these should be hopeless, and they would be very far-reaching; much more so than those who have not studied the subject would suppose. There is encouragement for such hopes in what has been done in America, where exhibition poultry are now bred and shown by standards framed nearer to utility lines. It is only in England that the Brahma has become a Cochin; in America it has still the long body and moderate leg-feather and close plumage which it had in older days with us, and is still a magnificent layer and table fowl. There the Leghorn still has a moderate comb, and pens produce their 215 eggs a year. The general result is noteworthy, in the vast increase of the poultry industry. Stock birds are sold to the farmers by thousands annually, and the farmers go to the breeders on a scale utterly unknown in England as yet, providing a steady market at good prices, which is far the best and most profitable support for a pursuit like poultry breeding. Yet in some respects the Americans are more "fancy" even than ourselves, and will disqualify for a hidden feather not visible on the surface, where an English judge would take no notice whatever. There is the same system of exhibition, and of judging by fixed outward points; it is simply a question of *modifying the judging*, in quite moderate degree and in certain definite directions shown to be required.

Fancy and Utility in America.

We have not mentioned crests, because we doubt if any crested fowl really is suitable in general for the British climate, nor are we satisfied that the evils alleged of the present large crests are as stated. If it were necessary, and opinion can be rallied to the necessity, excess could be checked by diminishing the points allotted to crest, and increasing those deducted for want of size or symmetry. All we are concerned about here is to point out that such evils—real or only imaginary—are not necessarily inseparable, as alleged, from *judging by fixed outward points*, but are definitely remediable by improving the defined standard for judging. It is to these practical, definite directions that effort should be directed; and the default of the majority of the earlier judges in such directions, at a time when unusually great power lay in their own hands, is the more regrettable, because judicious effort then might have prevented much which it is far harder to remedy now.

Another real and growing evil is the increasing tendency to split varieties in two by mating up different pens to produce the two sexes. The reasons for this are explained in our next chapter; briefly, they lie in insisting upon colours and markings for cock and hen which Nature does not permit to be correlated, or produced by the same parents. This also could be remedied, but can only be remedied, by modifying the standards so as to describe really correlated colours and markings. If this could only be done, we know of no reform which would have such manifold good effects upon poultry breeding generally; and the recent and growing agitation in America for "single matings" may perhaps bear some fruit, though we are not sanguine. It should, however, be pointed out that this evil, grave as it is, affects the welfare of the poultry fancy itself, by driving people out of it in discouragement (as it has notoriously done), far more than it does the practical usefulness of fowls; since the latter can easily be kept and bred of one of the sexual sub-varieties alone. The evil effects from the "utility" side then almost disappear.

Double Matings.

There are yet other evils now connected with the poultry fancy to which one cannot shut one's eyes. When fowls come to be looked upon in certain circles as mere marketable investments, or as instruments for exciting competitions in which great money interests are at stake; when, in fact, they are shown by anyone for mere pecuniary advantage alone, the proper purpose of poultry exhibition is perverted, exhibition is abused, and evil cannot but result. A new kind of poultry society often met with now—the keen and business-looking men who combine exhibiting with extensive dealing, and judging, and borrowing, and lending, and "advice" for which fees are charged, and other ways of making money—are not altogether pleasant to reflect upon. Such men can rarely be called true fanciers, though some of them, with all their faults, certainly are. Evils of this kind too, however, affect the poultry fancy itself more than the utility of poultry, for the birds these men exhibit to death do not enter the stock of the country. Those of them who are also breeders, may do some harm by inbreeding carried on without knowledge, and by that early breeding which has done so much to sap constitutional vigour; and these ill-services to utility are shared by others, real fanciers, who ought to know better. Such evils we can only hope to check by the spread of better knowledge. Thus it is that we must strive to teach some how to breed systematically without the evils of incestuous alliances; to enforce upon others the strong reasons for avoiding summer shows, and even the stock of their usual supporters; to urge upon all breeders and fanciers of the true stamp the study and sedulous avoidance of the class of shows particularly affected by the shadier class of exhibitors and judges. If this class of really worthless exhibitions, which any amateur can easily learn about for himself with a little inquiry and experience, could only be extinguished by such want of popular support and the growth of public opinion, and good *local* shows substituted, for local breeders only, like the district vegetable and flower shows so common in England, quite appreciable aid would be given to the cultivation of useful poultry.

Other Evils and Abuses.

Direct effort can also be made, and we are glad to know is being made, to improve the useful qualities of pure-bred poultry. As already observed, this improvement in useful qualities belongs properly to those who *want* poultry for those qualities, and the field has always been open to them. The "Utility" Poultry Club was founded in 1897, its primary object being "to encourage the breeding of pure and cross breeds for utility purposes." It provides classes for table poultry, for eggs, and for systems of packing and marketing. The Club also provides skilled advice for members, facilitates "change of blood" from good laying strains, and has been greatly instrumental in stimulating the cultivation and advertising for sale of strains of pure breeds bred specially for laying purposes. This is really practical effort, which has already produced result. We need hardly say that all the leading members of this useful body were drawn from the much-maligned poultry exhibitors, and that their utility fowls were bred from exhibition stock. The honorary secretary of the "Utility" Poultry Club, which now includes well over a thousand members, is Mr. L. W. H. Lamaison, Merstham, Surrey, of whom all further particulars may be obtained.

Work of the "Utility" Poultry Club.

Another valuable feature of this Club is its encouragement of "laying competitions," in which pens of pullets are started on the same day in separate yards under the same feeding and management. The Club's competitions have hitherto usually been during sixteen weeks in winter, commencing about the middle of October. Wherever held, such trials have proved the vital importance and return in profit of that *breeding for eggs* so often insisted on in this work. In the 1902–3 contest, several pullets laid no eggs at all, and many very few; but the winning pen of five (white Wyandottes) laid 276, or on an average over four eggs a week each all through the entire winter period. The following year, owing to the bitter weather, the top score was only 243; but it is noteworthy that it was the same yard and strain which won again, and also that the strain was from American pedigree layers. In the 1905-6 contest 251 eggs were laid by the leading pen (white Leghorns), while in the 1906-7 competition 237 eggs were produced by the winning pen (buff Orpingtons). Similar competitions for an entire twelve months have been held in Australia with very beneficial results. The average, per hen, was increased the second year from 130 to 163; no less than 15 pens in 1903 surpassed the winner in 1902; and most of the competitors had increased their production, the winning pen totalling 1,308 eggs from 6 birds, or 218 each. Experiments in Ireland have shown similar improvement, though as yet on a much lower scale. The value of such competitions in emphasising the value of "strain" rather than "breed" has been most useful.

Improvement of Laying.

A report issued by Professor G. M. Gowell, of the Maine Experimental Station, of the results of four years' work in systematic breeding is equally conclusive, and the main figures may fitly conclude our discussion of this important topic. Out of 67 pullets, he found four which laid over 200 eggs in a year. Selecting these, and the best of the others, the second year seven birds laid over 200 eggs, averaging 10 each more than the preceding four, and the whole flock averaging 127. The third generation produced eighteen over 200 eggs, the best one laying 251. The fourth year he was able to confine his breeding entirely to birds that had laid over 180 each, and twenty-six had laid over 200. Another view of the result is the fact that, while on an average of even the first three years only one bird in twenty-eight exceeded 200 eggs, the fourth year one bird in every seven did so. It need hardly be added that the breeding cockerels, equally with the pullets, were selected from the progeny of the best layers.

Exhibitions of Table Poultry.

Exhibitions of dead table poultry offer a very practicable method of effecting improvement in table qualities. In France such exhibitions were established by market breeders and feeders, whose proper business it is; but in England these classes had utterly neglected all matters of the kind. Again it was the much-maligned "fanciers" who came to the rescue, and established classes of this description, but for years utterly without support from those who should have been interested. Desirous to do their best, they began by appointing poulterers as judges, and tried to fill classes by entering themselves; but they could not compete with practical feeders and their practical knowledge, and their exhibits were derided, while the prizes went to just such large and "coarse" specimens as moved Sir Henry Thompson's wrath. By degrees fanciers were associated as judges; then the judging at once improved, and with it the fowls too, and these shows began to spread. At length the poulterers also have come to aid the movement, and the Table Poultry Show at the London Agricultural Hall in December is now one of the features of the year. But it was the fanciers who initiated this movement, and worked at it for years against sore discouragement, and without support from those on whose behalf it is supposed to be that they are so persistently attacked. It is they, also, who provide the stock which produces the best birds now shown; and one of the most significant features of these shows has been the steady displacement or disappearance of the so-called "Surrey fowls," for avowed (or unavowed) crosses between the fancier's pure breeds, and even by the pure breeds themselves.

Practical Conclusions.

As usual, then, the real truth about this question lies between the two extremes. The work of the exhibitor is absolutely essential to the poultry industry, and cannot be dispensed with. He has done most valuable work, and is doing it still, though his motives are his own. Nevertheless, besides some serious evils in the present exhibition system, manifest injury is being done by the present judging in some of the classes. Judging must be by outward points; yet some of these points, once adopted from good motives, are now known to be pernicious. But the remedy does not lie in wholesale tirades, which, on the contrary, obscure the real issues, and actually prevent what ought to be practicable reforms, or the alteration of present judging in certain definite points. On these should attention be fixed, and to these effort directed; and such reforms we would earnestly urge upon all concerned.

CHAPTER XI.

PEDIGREE OR LINE BREEDING.

EVERY desired quality which has become characteristic of a race or strain of animals is the result of repeated and continuous selection, year after year, of breeding stock which possesses that particular quality in more or less perfection. This is equally true whether we consider some purely "fancy" point such as the pencilling of a Hamburgh pullet, or some useful quality such as the laying of over 160 eggs in a year, or the profuse milk yield of a highly bred Jersey cow. Such a point may sometimes occur occasionally, or as if by accident, in some individual animal; but if it occurs habitually, as one mark of a strain or family, it has been *bred* into it by many generations of selection. Some seem to think that such is not the case with wild animals; but in reality it is in their case even more so. Darwin has taught us that the "natural selection" effected by surroundings, food, struggle for bare existence, and competition amongst surplus numbers, is most severe; it is unmodified by pity or caprice; and Nature does not vary her methods save in long periods and by imperceptible degrees. She does not select like man, making one choice this year and another the next, but her conditions are the same for generations, and often for ages; hence the wonderful uniformity and permanence of her patterns, as in the plumage of a partridge when uncrossed by any foreign strain.

Features Transmitted by Inheritance.

It is in this sense that the proverbial phrase of the breeder—"Like produces like"—is true. The "family likeness" of children to their parents is familiar to all. In most cases it can be clearly traced, and it can be seen that it does not lie as a rule in one feature only. In other cases some very strongly marked feature is the predominant mark, and in others no obvious likeness can be traced at all, while there may be obvious mental or moral resemblances. Supposing the father to have a pronounced Roman nose, the feature will probably be recognised in a portion of his offspring, while it may fail in other children, whose bodies, however, show other resemblances, complicated perhaps by stronger resemblances to the mother, or to other members of the families of both parents. So much is apparent to all; and in many cases, where no obvious resemblance can be traced to the direct parents, a very striking one often appears to the *grandparents*, or even to other ancestors still farther back. Thus we see that features have a greater or less tendency to reappear in posterity, even beyond the next immediate step in the family pedigree; and some extraordinary features, such as the possession of six digits instead of five, are often thus transmitted through successive crosses with great pertinacity. Many facts of this kind go to prove that every feature in every animal has *some* tendency to repeat itself, and would do so, more or less, were it not counteracted by other tendencies. If one human parent has black hair and the other brown, the black-haired parent has a tendency to cause that feature in his children; but this is modified or counteracted by that of the other to transmit brown; and both are modified by the colour of the hair in ancestors farther back. And the result here in any case is impossible of prediction, because there are so many discordant tendencies, and marriages have taken place quite irrespective of the colour of the hair.

What the Breeder does.

The breeding which is to succeed in producing valuable animals, consists in throwing *all* these tendencies into one desired direction, so that the influence of remote ancestors, of great-grandparents and grandparents, as well as of the parents, combine towards the desired point. Let us take a case. It would be very easy to find a fowl which, from some cross with the Dorking generations back, and never repeated, exhibited the fifth toe. Though really due to the long-back cross, such a fowl may be so rare in that farmyard stock of to-day, that we may almost call it an individual variation; however, we have got it. Breeding from such a hen it is probable that a few (and only a few) of her chickens may show the fifth toe, the greater part reverting to the common type. Mating a five-toed cockerel of this produce to a five-toed pullet, the number of five-toed progeny will be increased; but still (supposing, as we have done, no appreciable Dorking blood in the farmyard), not so very many; and the four-toed progeny will still have little tendency to produce five toes. But from these five-toed chickens again select a pair to breed together; we shall now find the tendency much increased; probably half the progeny might be five-toed, and even the four-toed ones would produce more or less five-toed chickens. In the next generation the tendency would be so increased that probably very few four-toed chickens would occur; and in a generation or two more a four-toed bird would be as rare as the five-toed one originally was. We have accumulated into one direction the transmissive tendencies of many successive generations, and we have now a *strain*, a race which we can depend upon with almost absolute certainty to produce birds with five toes.

A Strain.

Now suppose, we will not say the first hen herself, but even our first pair of birds from her, with five toes, to be still alive after six years, as might easily be the case, we might probably select from our last progeny a pair that as nearly as possible resembled them both in that and other points: we might be unable to see any difference at all between them as to the point in question. But their *breeding value* would differ enormously. The first pair have no tendency to be relied upon to any extent; the last pair can be depended upon as regards nearly every chick. The first gives us nothing beyond individual features, on which we were able, by care and system, to *build* a "strain"; the other pair represents work done, a point fixed, the "strain," which only requires ordinary care to preserve its character.

The Breeder's Difficulty

Breeding for one point only is thus an absolutely simple matter; but every fowl is bred for many points, which must be combined. Here the difficulty begins, and the novice usually finds that as he attempts to deal with any one of those points which need improvement, he is apt to lose in some other already attained. The reason for this is of course the fact that the faults as well as the good points in a parent tend to be reproduced; and it is impossible to say when the tendency to revert to any past fault apparently overcome is practically lost; *absolutely* lost it never is, and the fault may crop up again on any provocation, after even twenty generations of absence. And the novice in breeding is almost constantly offering such provocation towards the reappearance of apparently banished faults. As each defect becomes distinctly apparent to him, he is apt to select or buy a bird to correct it. Every time he does this some influence really is exerted, and if this were followed up the ground gained might be secured. But little is done towards *fixing* the point by only one step; while the following season some other point probably appears to need correction, and he goes off after that. And so he goes on, apparently getting little farther at the best, and too often confronted by the unexpected appearance of new faults which fill him with as much amazement as despair.

Effects of Crossing.

The greatest service Mr. Darwin ever conferred upon breeders was to account for these unexpected reappearances of long-banished defects, and to explain the kind of "provocation," as we have termed it, that recalled them into being. He clearly showed, by a large amount of evidence, that the *mere fact of crossing* between two entirely alien families has a peculiar tendency of itself to produce reversion to such *long-lost* characters. Thus it is that when two different breeds of poultry are crossed, there is always more or less production of that black-red plumage which it is believed was the colour of the wild jungle race of fowls; or, when two non-sitting breeds are crossed, there is often a considerable recurrence in the progeny of the long-lost instinct of incubation. In less degree, but still in a very great degree, the same applies to unrelated families of the same breed, which have tendencies to different defects, or even which have gone through a *different course of breeding* (as illustrated presently) in regard to the points bred for. We knew a case in which the mating with first-rate Spanish hens of a cockerel of the finest quality from another strain, produced an amount of red in face sufficient to make a genuine Spanish fancier tear his hair. This and many similar occurrences Mr. Darwin has made perfectly clear, upon the simple principle that the mere act of crossing—the mere fact that it *is a cross* in the strain at all—has a strong tendency to cause the reappearance of long-lost characters, which will generally of course be bad ones from the breeder's point of view, and this in great degree independent of the individual merits of the birds crossed.

Successful breeding, therefore, such as builds up a real "strain," or maintains a high standard of excellence already attained, will consist mainly of two factors. We must study on the one hand such a *course of selection* as will work steadily towards the desired end, without frittering away the ground gained by unsystematic little side-efforts which leave no permanent mark. And we must also work out such a *course of breeding*, or family mating, as will protect us from those dangers which Mr. Darwin has so clearly explained.

The Factors in Breeding.

The first of these factors will appeal most directly to the eye and to our individual choice, and we will take it first, beginning with a little consideration respecting differences in faults. There are many which a breeder half anticipates, or dreads to see in his chickens, but, when he does find them, puts down to his own bad luck or want of skill. There are others which, if he found, he would not account for on that ground, but would justifiably conclude that he had been swindled as regards the stock itself. In Brahmas he may dread want of pencilling, or colour, or striping, but he has no dread that he will find a Cochin's single comb. Here, then, is a difference, and it must have a cause. Thinking over it—and every real breeder must learn to think about things—he will discover that the difference lies in this: That the pea-comb has long been regarded as such an absolute requirement in a Brahma, that for many generations birds which did not possess it were *never* bred from. It was not so once; we can remember single combs, which were figured occasionally in the earlier books. But now, for generations not one single link in the chain of succession has ever been dropped as regards the pea-comb, and every one of these generations has added to its fixedness. Such an unbroken chain of succession, in which parents, grandparents, great-grandparents, and so on, all add their respective tendencies towards the desired point, is therefore what we require to fix our good points.

Course of Selection.

Here of course the breeder's difficulty begins; for he has to keep up the continuous attention and selection necessary for any particular point, consistently with the claims of other points also wished for, the whole being too seldom found *together*, in perfection. It is a hard task enough; still the true principle, and the proper course, are quite clear, and utterly opposed to such arbitrary and piecemeal work as was alluded to above. He must first consider all his principal desired "points" in regard to their *comparative* difficulty and value. As a rule, the difficulty of a point very much determines its value, and it varies much. Some points are obtained with comparative ease, and are readily transmitted even from parents, so that a single mating will produce them in a fair proportion of chickens others will need years of work, and one unhappy mating may upset much work already done. Comparing many breeds and varieties, we have found that about *four* points will in nearly all of them cover those which cause real difficulty and require serious breeding for, those beyond four giving little anxiety or trouble. Let us consider these, therefore, and suppose that, taking all things into account, we have determined their order in difficulty and value, to be expressed by the letters A, B, C, D. The breeder must, then, take first of all the point A, and if possible also B, and fastening his attention chiefly upon these, *keep it there;* in his very first mating, and ever afterwards, giving of course such heed as may be also possible to C, and then to D and other less material features, but always keeping as chief in his selections first A and then B. Thus out of his first produce the best are selected primarily in regard to A and B; next to these choosing from the best in C and D also, but not allowing choice for these to overcome the choice for A and B. That is what we mean by our "*course of selection.*"

As a corollary to this, for the first year or two at least, the breeding must only be from a few of the best. If, as is probable, more hens are wanted merely as mates in a pen, they should be of some variety which is distinguishable, or other means taken that their eggs are not hatched with the others, such as the recording nest-boxes presently mentioned. Without such precautions, where inferior hens of the same variety are used, if the cock is first-rate and of strong influence, or "prepotent" (as such strong transmitting power is called), they may "throw" a few good birds—the word exactly expresses the chance nature of such a result. The novice is apt to think this a clear gain; and in the sense that he may have a bird or two more to sell, it perhaps is so; but we consider here only the breeding point of view. From that, it will be seen that unless this chance progeny can be clearly distinguished, and *only* reserved for sale, it puts back the power and value of his strain, and is a loss of ground and valuable time; since he may breed from some of the birds thus produced, and then they "throw back" or revert to their poorer parent, and he has lost ground. At the earlier stages especially, a man who really means to breed good stock for himself can only afford to breed from the best he has, even though it be a single pair of birds; such a pair are indeed, as we will show presently, if absolutely healthy and vigorous, of themselves sufficient to found a strain. Neither can he afford to sell his really best birds at an early period. Later on he may sell stock far more perfect in points, and really of higher breeding value too, because his work will then be largely done; but in the earlier stages he is losing the very work itself, if he loses the best embodiments of it.

Effects of such a Course.

The second and, still more, the third year's breeding will show a marked advance; but it should be understood where this is to be sought and how measured. If our breeder was able to afford first-rate specimens at the start, there may not be one chicken apparently a bit better now. But the *proportion* of good ones in the produce will be increased, and it is this proportion which is the chief test of real progress; moreover, as this increases, in the long run the "*very* best of the best" must be better too, which bears on the question of prize-winning. In any case, out of those good in points A and B we shall have much less difficulty now—perhaps very little—in selecting specimens good, or fairly good, also in C and even D. Thus we reap the advantage already of never dropping the main points A and B. Though imperfectly fixed, even yet, they are *so far* fixed that we find we have a wider choice in regard to C and D as well; and it will be more and more so in each succeeding generation. It will even be found that when the most cardinal points are thoroughly secured, a little may be occasionally risked; and this is another great advantage of such a course of breeding as here described. Our points A and B will have become at last so fixed that a bird a few degrees worse in one of them may occasionally be bred from for the sake of some other point badly wanted. But let the nature and reason of this procedure be understood. It is simply that the main point, known to be so fixed, is probably only accidentally somewhat deficient in the bird so chosen, which is therefore *trusted* to revert to the more perfect type in his or her progeny. Such a step should only be taken with caution, and never repeated through two generations; nor should a bird absolutely bad in point A or B be so used. It is only that one not quite so good in the first points may be occasionally *risked;* and that even so it is a risk should not be forgotten.

Different Courses and their Results.

Such is what we have termed "a course of selection" in forming a strain, and in default of which there is little deserving the name of a strain at all. There is just one more point about it which is worth mention, especially as it will lead us naturally to the other of the two great factors referred to above. It will be obvious that two breeders, in starting to breed the same variety, may adopt "courses" somewhat different, led thereto by the tendencies of their original stock. Suppose two men starting in Buff Leghorns. One may have birds from a stock in which much colour-work has been done, but good combs are rare; while the other's first stock may be generally good in comb, but very rarely indeed good in colour. Both would probably place colour and comb as the first two points; but comb might probably be the A of the one, and colour of the other. This difference in the course of selection has a consequence whenever such two strains are crossed, which we have never seen pointed out clearly. We will suppose both breeders to have bred for some years, with care and success; then at the last their birds will probably be to all intents and purposes *alike* in appearance, equally good now both in colour and in comb. We proceed to cross these strains—a bird from each, and both good birds, assuming that the blood has never been mingled before, but that it is what is known as a "raw" cross. The result of the cross—*merely as a cross*—in conformity both with what Mr. Darwin has taught us and with wide experience, is more or less reversion to the ancestral characteristics; and here these are governed largely by the two "courses of selection" in the two strains. In one the more remote tendency is to a bad comb, in the other to a bad colour. The result of the cross is therefore very likely to be, in the first progeny, a great deal of reversion to *both* these faults, so sedulously bred out.

Fresh Blood.

We thus see the importance of finding out that a bird purchased for "fresh blood" is not only good in itself, but the product of a "course of selection" similar to that in the home yard; that it has not only reached about the same point, but reached it in about the same way. It is this which throws light upon a very common disaster, after some rash use of fresh blood from another yard. We find something in our stock needs remedy, though secondary to the all-important point to which our own chief attention has been directed. We find a cockerel that gives us what we want, and also seems all we could wish for in what is to us the all-important point. All, therefore, seems safe, and it may be so—happy for us if it is! But, on the other hand, the bird may be almost the only one in the other yard that has our own point A near perfection—only a happy and rare exception. If so, we shall have trouble, for his progeny will tend to the more average and lower standard (in that point) of the yard from which he comes. Or the matter may be looked at in another way. The products of any carefully bred strain are the embodied result of a number of characteristic tendencies struggling together, some stronger and some weaker. Some of these have only been made strongly predominant by the long and repeated selection of the breeder; others, on the contrary, regarded by him as defects, have been kept down or made subservient—what he calls "bred out." Still, as subservient tendencies they still exist; he does not know in what way or in what proportion. But when we introduce a sudden cross from another yard, quite a new set of characteristics are introduced into the struggle for predominance. It is no matter for surprise if some of these combine with those of the home strain in new ways, and that so one or other of the subservient or suppressed tendencies may acquire fresh power. For some or all of these reasons, a cross with totally alien blood too often entails more or less reversion to *something* long left behind and overcome—something, we do not know what; and so far it has a distinct tendency to undo (for the time) what may be the work of years already done.

These facts and their reasons must modify very considerably what used to be insisted upon in all the earlier works upon systematic breeding, concerning the necessity for continually introducing "fresh blood" into a strain. Such instructions are never pressed now by authorities who have ever bred any animal whatever with success. On the contrary, it is well known that the introduction of such fresh blood into any strain which has once been brought to high excellence, is a most serious matter. In small yards it may be necessary, from inability in such small space to preserve sufficient independent lines of breeding, which alone can supersede it for any length of time. In large yards, which are able to do this, the necessity should be rare, provided proper care is taken to stamp out diseased or weakly stock. Whenever the necessity does arise, be it often or seldom, no pains are too great in the way of inquiry or personal visit to the other yard, or anything that may possibly give information, to ascertain what the purchased bird is likely to breed, or if any known tendencies to particular faults exist in the strain. Having done all that is possible in this direction, it is best in general, where feasible, to let the purchase be a hen or pullet. Then, if the experiment be even an utter failure (as on rare occasions it may be), the rest of the yard is not tainted by it, and in the more usual result of partial failure and partial success, the wasters can be discarded without further harm, and the more perfect progeny bred back to the home strain with success. If a cockerel is introduced he is better mated with one or two hens most carefully selected, making up the pen if required with others whose eggs will not be confused with theirs. Then his produce will be similarly selected, and "bred back" to the strain by the general method presently explained. In all cases birds from the cross should be selected for further breeding with unusual care, with even most rigorous severity, because the newly introduced tendencies have become fresh dangers to be guarded against.

A yard known to be more or less allied in blood is much less dangerous. Thus, a bird may be bought from some one to whom eggs or stock have been previously sold, or from a yard to which the strain partially or wholly owed its origin some years before. Two breeders, who are well acquainted with each other's yards and sell or exchange birds every now and then, can help each other materially in this way, keeping up enough common blood to remove most of the danger from the mere cross, and so imposing no task beyond that of ordinary selection alone. To this interchange of stock amongst five or six breeders in Bristol, was chiefly due the excellence and vigour of the Spanish fowl during so many years. To reap such benefits, however, neither party must strive to reap all of it, denying his brother any. Such foolish jealousy will quite defeat its object, since there must be mutual help, and a real willingness to give it, if any real mutual benefit is to be secured.

Line Breeding.

It is most important, however, to understand the manner in which, given only a sufficient amount of room, line or pedigree breeding may be carried on without a cross. The genuine breeder cannot do without such line breeding; while, on the other hand, if "in-breeding," which is allied to this, be carried on indiscriminately or to excess, a limit is found in physical weakness, deterioration, or infertility. Darwin's researches have made it doubtful whether this is any necessary result of in-breeding *in itself*. It appears, on the contrary, most probable that the cause lies rather in the fact of both parents having the same constitutional taint where there is any at all; such taint is therefore intensified, like any other point possessed by both parents alike. Where Nature's own severe selection for greatest strength and vigour is carried out, there are many proofs that much and repeated in-breeding seems to cause no ill-effect. But the breeder cannot kill off in Nature's wholesale way, and must fight the danger by other methods. The essence of that danger lying in two parents possessing the *very same* elements, the union of own brothers and sisters should be worst of all. Experience proves this to be the case; and two generations of such mating in succession will generally work conspicuous evil. The union of parent and offspring is much less injurious, the offspring having only half the blood of one parent; but this, too, must be kept within limits. Other relationships may be carried far, provided only that *variety* be found between the blood of the two individuals mated; and by bearing this principle in mind a strain may be successfully established from two individuals alone, and carried on for years without a cross.

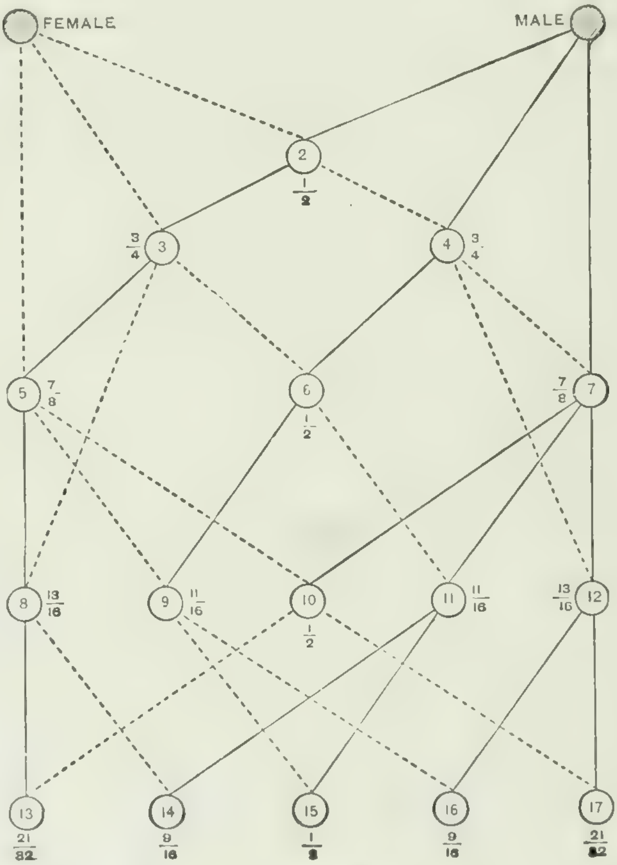

Fig. 79.—Mr. Felch's Breeding Chart.

Felch's Breeding Chart.

Mr. I. K. Felch, the veteran judge and breeder of America, many years ago published in a little book of his, called *Poultry Culture*, a kind of chart showing at a glance the main principle on which this should be done. We have evidence that this chart has actually been of practical benefit to several well-known breeders in England, even as then published; but in some subsequent correspondence Mr. Felch very kindly sent us an improved form of it, which we here reproduce, with a little further modification to make its meaning more clear. We suppose the strain to originate in two individuals only, though in the case of fowls, of course, several hens or pullets might be used as one of the units. In that case, however, all should be of the same breeding.* The two original units must, of course, be perfectly vigorous and healthy, and either unrelated or only distantly related in blood. They should always be from different yards, for it is found that even change of ground has some effect in producing that "different blood" which has so much to do with avoiding constitutional disease. Taking our two original units, then, Mr. Felch's chart shows how they may be bred so as to maintain health and vigour.

In reading this chart, every dotted line means a female—*i.e.* a hen or pullet, and every unbroken line a male. Wherever two such lines meet *at a point* the circle at that point denotes the produce of the mating, bearing a number distinguishing it as a group or product; while the fraction outside the circle denotes the mixture or proportion in that product of the blood of the two original units from which is bred the strain. The first year, for instance, the original pair produce group 2, whose blood is half-and-half of each. The second year the original female, or one of them, is bred to a cockerel from group 2, and the original male to a pullet from group 2. Thus are produced groups 3 and 4, each of which possesses three-fourths of the blood of the unit on its own side of the diagram. Here begins the real work of the breeder, since these mates now taken from group 2 must be most carefully *selected to type*, according to that "course of selection" which we have already discussed. From the very first all depends upon this, and, of course, the two original units have been chosen with equal care, so far as money and opportunity allowed. The third year a cockerel from group 3 is mated with the original hen to produce group 5, and pullets from group 4 to the original male to produce group 7, all of which possess seven-eighths of

* It need hardly be pointed out that in this case the scheme may be carried out with less in-breeding at the first stages, as a cockerel might be bred back to an aunt instead of to the mother. But unless the hens or pullets are full sisters, the result will not be the same or have the same certainty. Hence the utility of the recording nest-boxes mentioned farther on.

the blood on their own side, and are to be rigorously selected *true to type* as before.

But the most noteworthy mating this year, to which we would call special attention, is that of a pullet or pullets from group 3, with a cockerel from group 4, producing group 6. It will be seen that all the members of group 6 possess equal or half-and-half blood from the original parents, as much so as group 2. We also mate a pullet from group 5 and a cockerel from group 7, each of these owning seven-eighths of the blood of one ancestor, and we again produce in group 10 a progeny whose blood is half-and-half. Now suppose we had mated brothers and sisters from group 2 to produce the half-and-half blood and age of group 6, and brothers and sisters from these to produce similar equality of blood at the age of group 10, the result of such incestuous in-breeding would have been swift degeneracy. As it is, we have made our matings from lines characterised mainly by the original male and female, and yet preserved the same mathematically exact equality of blood in our group 10. A generation farther on we can produce group 15 as shown, from groups 9 and 11; or we might have mated groups 8 and 12; or the produce of the former may be mated with that of the latter. We have thus seen how it is possible to keep up the half-and-half blood of a cross, intact and exact, without any loss of size, fertility, or vigour.

Three Strains from One Stock.

We also see plainly from this chart that by the time we have reached the stage even of group 10, we have got in our hands practically *three strains;* for while group 10 possesses equal blood of both sides, group 8 has thirteen-sixteenths of the blood of the hen, or practically represents the female line; while group 12, in like proportion, possesses the blood of the male line. Yet all are related sufficiently to prevent evil; and all have gone through the same "course of selection" towards our own fixed type. From this point we have ample material to go on with indefinitely, and need not pursue that matter farther. The bottom row of groups simply shows some of the results in the next generation. But one point more may be illustrated. Suppose that for some reason—as for special cockerel or pullet breeding—we want to establish also a line of sires in which predominates the blood of the original female. The chart shows a cockerel from group 5 mated with a pullet from group 3, and a cockerel from the produce in group 8 mated with a pullet from group 10. The result in group 13 gives us the same proportions of blood, but derived through a cockerel line of breeding.

Whenever a cross is necessary in a strain, such a chart also shows the procedure that should be followed. The cross is treated as a new unit, and its produce re-mated back to the home strain in the same way, carefully selecting for the desired type as before. This is what breeders and fanciers term "breeding back" to a strain, and the philosophy of it can be clearly understood from such a diagram as that before us. Every cross thus involves more or less breeding back to the "line" afterwards; but this need not be carried to the extent of incestuous matings, or interfere with vigour in any degree. The out-cross is not used as immediate material, but to provide either pullets or cockerels for really breeding into the strain the following year.

Single Matings or Double Matings.

We have now considered the two main factors of line or pedigree breeding, as carried on by those who really understand it and practise it with success; but a few remarks should be added respecting the question usually described as that of "single or double matings." Did the exhibition standard of the fancier for the two sexes of any variety correspond with the relations Nature is ever seeking to establish, the same mating ought to produce birds of equal excellence in both sexes. But unfortunately in many varieties this is not so. The reason for this in most cases is pretty obvious, primarily in the differences of distribution in the colours in the two sexes respectively, and secondarily in the propensity of fanciers either to accentuate or to diminish these differences. There are instances of his doing each of these.

As a type of one case we will take the Dark Brahma. This is a variety in which, like Dorkings, several colours in Game, Partridge Cochins, etc., the colour is distributed in the hen amongst small markings; while in the cock it is collected in large masses, of which the dark are mainly upon the under, and the light coloured ones upon the upper portions of the body. The fancier has exaggerated this, and now seeks in the pullet a uniform dark pencilling all over a dirty white ground; whilst for the cockerel he wants a glossy solid black breast and fluff, with nicely striped white hackles and clear wings. The two, in this degree, are largely incompatible as regards breeding from one pen. The nearest we could come to it would be to mate with pullets as described a cockerel with good striping in the hackle and black breast, but the fluff laced with a white edging. We might get some really good pullets, such as won twenty years ago, though too dark for present fashion; but a majority of the cockerels would be either laced with white on the breast or have white ticks at the tips of the feathers there. This, then, is the type of cockerel which corresponds with the type of pullet sought, while the darker pullets approximate to the type of cockerel sought. It is but natural for the breeder to mate up his exhibition or black-breasted cockerels with the darker females, though deficient in marking, for cockerel breeding; while with his best-marked and lighter pullets he mates a ticked or laced cockerel for pullet breeding. If he will insist upon such strong contrast, he must do so; but one cannot but reflect how much better it would be to recognise a nicely laced or evenly ticked breast in the cockerel, as was once the case; for the practical result is that any variety, when thus treated to excess, becomes practically *two breeds* instead of one, to the confusion of the novice, the inconvenience of those who have not space enough for both, and the driving of many out of that particular breed altogether.

As an example of the opposite tendency, to obliterate natural sexual differences, the barred Plymouth Rock may be cited. This fowl has now been bred for close upon forty years, and all experience shows that the natural correlation of the sexes is for the cockerel to show a much lighter as well as more narrowly barred plumage than the female, which is by comparison coarser in marking and darker in colour. Not much has yet been done as regards scale of marking, though some progress has been made in giving the females a smaller pattern; but persistent efforts have always been made to lighten the females and darken the males. From this upset of the natural relations we again encounter the necessity for double matings, if the best results are to be produced in the greatest numbers. The laced Wyandottes, of all colours, in which the natural relation is for the cocks to be much darker on breast and less open in lacing than the females, furnish another instance of the craving of the fancier to obtain uniformity in the face of natural differences, which has similarly involved a system of double mating.

Evils of Double Matings.

Other instances, and their details, must be left to their proper places, but two general remarks may be added on this subject. We see first the need there may be to preserve a line of cockerels in the female strain, or *vice versa*. The manner of doing this has been already described and illustrated by reference to Mr. Felch's chart. Secondly, however, it must be insisted upon, and is self-evident, that although it may be made necessary by the demands of the fancier, such a system of double matings is in itself a sore evil, and every effort should be made to keep it within bounds. The male and female lines should not, if possible, be allowed to become absolutely divorced or separated, as it is in some cases. Much can often be done if really attempted and carried on through systematic line-breeding from one strain of blood. In the very year before these lines were written, at the Crystal Palace Show, we happen to know that the second-prize Dark Brahma hen, the second-prize adult cock, and the first-prize pullet, stood to each other in the relations of grandmother, her son, and her grand-daughter in the same line-bred family, though the cock was not available for exhibition until he had moulted out black.

One means by which this object may sometimes be at least partially secured is to mate a cock or cockerel with hens or pullets of two or more types. It is often done by some breeders merely as a speculation. They hope that if one hen does not "hit" with the male, another perhaps may do so. This does, in fact, often occur, and is another good reason for starting a Felch chart with a pen of females. If the eggs and chicks are identified, the bird or birds which "nick" best can be preserved, and the others and their progeny discarded. We are not, however, referring to that, but to more systematic procedure, as when a Dark Brahma cockerel, ticked as a cockerel but moulted black on breast his second year, is mated to one or two pullets of fashionable light ground colour, and one or two much darker birds. Such a mating may very likely produce some good pullets from the first lot, and some good cockerels from the second; but there are many cases where it is not practicable, as failing to produce the present recognised standards.

Recording Nest-Boxes.

For many of the reasons or purposes referred to in the preceding paragraphs it is often needed to know not only the pen from which any chicken is bred, but the *hen* which is the mother. People constantly about, with only a few fowls, soon get to know the egg of each bird; but with careful breeders for several years past there has been increasing use of what are termed "recording," "registering," or trap nest-boxes. These are so arranged that the hen can enter, but her entering closes the door behind her, and there she remains till she is liberated, when her number or name is noted. Mr. A. Silberstein was probably the first to design such a nest-box, and sold his pattern by scores; since then many have been brought out by others. We illustrate one published in the *Feather* by the late Mr. C. H. Payne, C.E., which will sufficiently explain the essential action of all such contrivances. Fig. 74 is a section and plan, and Fig. 75 shows the entrance both open and shut. The hen steps up a trip-board pivoted about two inches out of centre, the upper or farther end of which has two catches which hold open or apart two half-doors through which she enters. These doors are hung by hinges (which must work very freely) rather slanting or out of plumb, so that when the bird walks on to the further end and depresses the board and catches, they swing back and imprison her; they do not quite meet in the centre, so as not to grip her tail. The door at the other end is opened to take her out, when the slide is pulled forward to open the entrance doors again, acting as a "spreader" between the leaves, and forcing them over the catches, which gently slant from the centre of the trip-board, but are square at the holding end. The slide is then pushed in again, and the nest is re-set ready for the next.

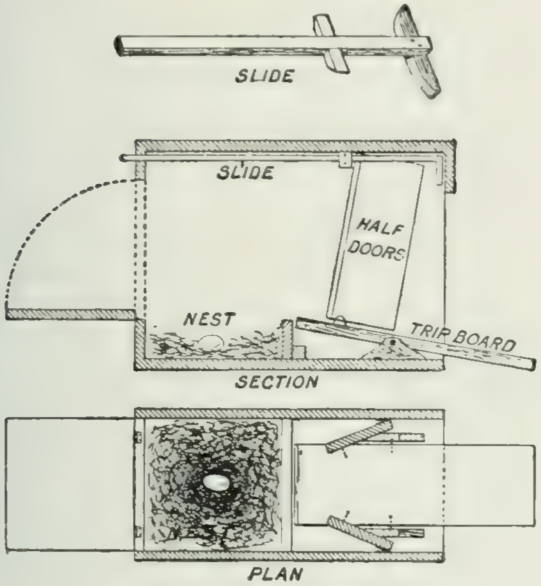

Fig. 74.—Plan and Section of Trap-Nest.

Such nests need, of course, constant attention to take the hens out and re-set them. They are understood to be looked up about every hour. They may therefore suit large establishments where a man is always on the spot, better than average English practice. They are most largely used of all, however, to pedigree the best layers, and the time consumed in looking after them is reckoned time well spent. As Mr. Boyer writes in *Farm Poultry*, "Is it as costly to spend five or ten minutes every hour looking after a lot of traps, as it is to feed and care for a lot of hens that are not paying board?" Also the handling of every hen by herself, so frequently, is found a good thing every way. At all events, it is in this way that the pedigree laying strains of America are being built up. There is however a less exacting system sometimes pursued, the further end of the nest having similar doors without any catch, which the hen can open for herself, and giving her exit into a separate "detention" pen, where she remains till seen and allowed back to the other, while the first door is made so that she can enter at will, but cannot return when it is closed after her. This method gives knowledge in most cases of birds which have laid, though some hens go on the nest without laying at all; but only the identification of every bird singly can give really strict record of the breeding.

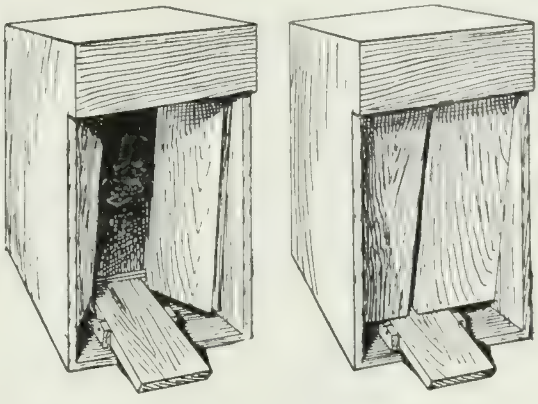

Fig. 75.—Nest Open and Closed.

Other ingenious devices have been brought out, but in all, save that mentioned in our last edition, where the hen on leaving the nest was said to be automatically invested with a collar, the human element is necessary for the bird's release. The latest development claims only to trap the bird after an egg has been laid, and if this holds good in practice non-layers will not be detained. With the large increase in trap-nesting, there is every hope that appliance makers will devote greater attention to this branch of their industry.

CHAPTER XII.

PRACTICAL BREEDING AND REARING OF PRIZE POULTRY.

THE present number of breeders of prize poultry vastly exceeds the figures of a quarter-century ago, and every year shows additions to that number; but it is as true as ever that the measure of success attained by them differs widely. All cannot equally succeed, in fact, and much harm has been done by the advice of some authorities, who have constantly taught in journals devoted to these subjects that, with capital to purchase a few good birds, properly mated, at adequate prices, a considerable profit can practically be "assured" from breeding exhibition stock.

Prize Breeding not a Certainty.

There are many people who do really make a living by breeding, selling, and exhibiting prize poultry; but this is generally the result of years, and in many other instances the would-be breeder is fain to retire with more or less loss. While some take up the poultry fancy merely as a pleasant and fascinating relaxation, others make it the serious business of their lives, and study it as such in all its branches of breeding, exhibiting, advertising, and selling—the last being perhaps as important as anything, since such a man, if he has a decent reputation, may get two to five guineas for a bird quite readily, where a beginner would find great difficulty in disposing of the same fowl for ten shillings. This difficulty in *selling produce* until a certain standing has been gained and reputation created, is not taken account of by advisers of the school above alluded to. If it be remembered that the prizes at a great show go chiefly to a few birds picked from hundreds bred by old and experienced breeders, and that the novice, with his produce from the pen mated up for him at a fee by one of these advisers, has to take some respectable position amongst them before he can find a market, the folly of such wholesale promises and anticipations will be realised. Nevertheless, the field is perfectly open, and upon the whole—spite of what is so often written by disappointed parties—free from favour. Although genuine breeders are so much more numerous than formerly, the combination of qualities which make a successful one is still so rare, that anyone possessing these (amongst them sufficient patience and perseverance) can make his mark. We cannot promise success in the indiscriminate manner above censured, and it would be presumption to attempt to instruct such as know already more than we can tell them; but assuming that these chapters may be read by many persons with some knowledge of fowls, who are thinking of further attempting to breed prize stock, we will endeavour to make clear the general course that should be pursued, and what should be avoided.

Study of the Type.

If the preceding chapter has been understood, it will already be seen how it is and why it is that it seldom answers to claim the first-prize cock, and hens or pullets occupying the same position at some prominent show, and mate them up together for a "start." If it can be afforded, when the time comes by all means let first-class specimens be purchased, though as a rule they will need quite different mates from their fellow-winners of the other sex. But for a novice this time has not come, for the simple reason that he does not *know* enough to begin breeding; and his first object should be to get the points and true ideal of the breed really into his mind and eye. He has first to study the standard description, with the aid of an ideal illustration. The description should then be compared point by point with winners in the pen, and shows should be visited with this object in view. Information should be sought in detail of any exhibitor or other amateur, and will almost always be freely imparted respecting any definite detail concerning which it is asked. Pleasant acquaintances and occasionally a friendship may be made in this way. Disappointed exhibitors are especially free in pointing out where their bird surpasses the actual winner, and often with truth as regards that one definite point; but the inquirer will be provided with a grain or two of salt, and especially remember that most likely there are additional points which bear the other way. Perhaps he may be able to get the judge's or the winner's views also, and then, like Dickens' celebrated writer upon Chinese metaphysics, he can "combine his information," which will both inform his mind and be great fun.

Until a man has thus got the type itself thoroughly into his own mind, he cannot breed it successfully. It is not enough to know the variety when he sees it, or even good birds when he sees them; he must know definitely *what* makes these last better than others. That is why we have spoken, advisedly, of one variety, or possibly two varieties but of the same breed. Not only, by attempting more, are all the practical difficulties and problems of breeding and selection increased enormously, so that what might be a pleasure becomes an anxious care burdensome to mind and body, but each one needs the eye to be thoroughly *trained* in all its points, and some varieties very much bias the eye in regard to others. Old and experienced breeders and exhibitors may manage more, but they are constantly studying at shows, and have their past successful experience to guide them; and even these always make some special study of a fresh breed before they actually meddle with it. At the same time, the intending breeder need not keep away from actual specimens of the fowl he fancies, and this early stage is the proper one for sittings of eggs, or the purchase of a brood or two of newly hatched chickens, to be reared by hand. If an absolute novice, he will be thus getting his practical knowledge of chicken rearing and some knowledge of the breed itself at the same time; can see how the chickens feather and grow up; will understand the "points" better and better as the birds become familiar to him; and finally, when full grown, comparing these chickens with prize specimens, will learn the points that need development or improvement, studying systematically to see *where* lies the great difference in exhibition value. Cheap specimens unfit for the show pen, but still typical, may be purchased and bred from, with the same objects and results.

Purchase of Eggs.

In one season and at very small expense, anyone with real aptitude ought thus to have acquired a practical and sound knowledge of the variety he proposes to take up; and something also of how the beauties and defects develop themselves as the chickens grow. If he has bought eggs from good breeders, he may probably have a good chicken or two from them in his own yard; but too much must not be expected from such sources. Many people are utterly unreasonable in regard to sittings of eggs, so much so that some of the best breeders now refuse to sell any. Such people expect every egg to hatch, and every sitting to produce at least one if not several "winners," whereas the man who sold the eggs will be well content if out of the many he himself hatches, and which have not travelled, he gets a real winner or two himself for the great shows of the year. Many vendors undertake to "replace unfertile eggs," and the offer is liberal and fair where such are sold in numbers, from flocks of typical and pure bred but not first prize stock, but a seller of really prize eggs simply cannot afford to do this. We often wonder people do not recollect how we used to hear proverbs about "a hen with one chick," and about "counting chickens before they are hatched," long before eggs for sitting from prize poultry were even thought of. Of real fraud we are sure there is very little, and four or five chickens from good eggs are well worth the price of a sitting, even if there be not one actual winner amongst them. Actual winners must be scarce from the very nature of the case; but they do occasionally occur, quite often enough to show a really high standard of honour among at least a good number.* Thus a beginner who has purchased eggs may probably have at least a decent bird or two, true to type and of fair quality, at the end of the season, and if he has, we strongly advise entering it at the best show he can manage *to attend;* not in the hope of winning (though now and then an agreeable surprise may occur) but that he may compare, on the spot, this best specimen which he can select, with those which do win. He will be a more intelligent critic by this time, and begin to see things; and the comparison with his *own* bird, which he has learnt to know, will make it all real, and stamp it on his mind in a way which nothing else can.

Now at last he is ready to purchase birds, and will be able to do so with some judgment of his own as to their real value. His year, so far from being wasted, has done valuable work which *has to be done* before he can succeed, and may just as well be done at small expense as at a great loss.

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* As it is many years since we sold a fowl or an egg of any kind, we may without impropriety mention a few instances from the days when we had Dark Brahmas. A pullet repurchased from our own eggs was in our first-prize pair at Birmingham in 1871, and the unpurchased remainder established the purchaser (Mr. John Evans) in a strain that was prominent for three seasons. A cockerel repurchased from another egg customer won second prize at Bristol in a class of forty, and was the father of our cup winner at the Crystal Palace and Birmingham shows of 1872. A hen hatched from our eggs won the cup at Yarmouth in (we think) 1872, was pronounced by the judge the best he ever saw, and purchased by Mr. Horace Lingwood for £20, the highest price given for a single hen up to that date since the early Cochin mania. A cockerel hatched from another sitting of our eggs was purchased by the same gentleman, and expressly mentioned in the *Poultry Review* as the immediate progenitor of eleven cup and first-prize winners, and of a strain of cockerels which proved almost invincible for years. Similar cases are known to us in connection with other breeders and varieties of poultry.

Purchase of Stock.

We do not advise further purchases of eggs at this more advanced stage, unless there is money to spare and room to keep the produce separate; in fact, not even then. The drawback is that you do not know what the result is worth till months later, and if then it does prove satisfactory, you are still ignorant of the mating and breeding which produced each bird. It is better to purchase actual stock, and so have something definite; though if any of the chickens already hatched from purchased birds are worth breeding from, as may well be the case, by all means let them be considered as stock, and proper mates procured, spending the more of what can be afforded upon the new purchases. It will depend upon circumstances whether or not these latter are prize exhibition specimens.

Exhibition of the Purchases.

Much advice is given upon this head also, as to the sums to be "got back" by prize-winning towards their cost; and an experienced exhibitor does often make a profit from exhibiting a specimen, which also keeps his name before the public. But a novice has little skill in caring for birds thus shown, which in his hands will probably lose condition rapidly, or may even die; and in any case, and if he so far succeeds and does get back a great part of the cost, he has missed his real object, since fowls thus frequently shown have too much taken out of them to produce eggs with strong and fertile germs. If the birds are good enough to win at one or two of the really principal shows, that will do them no harm, and will do useful work in bringing a new breeder's name before the public as owner of good stock, which will help him later on; but to buy good stock and work its strength out in exhibition before breeding is—we have seen it often—a mistake in the end.

Yet as good as can be afforded should be obtained by all means, now the start is made.

Mating of the Stock.

Details of mating belong to other portions of this book, and must be sought in proper place; but one general point applies to nearly all cases of "double mating." In these, as a rule, the cockerel or cock of a cockerel breeding pen, and the pullets or hens of a pullet breeding pen, are desired of the highest possible exhibition excellence; thus the better that can be afforded, the less uphill work the breeder has to do. So much is mainly a matter of money, and the choice of the exhibition components can be made personally from what is seen. But the mates for these birds cannot be so selected, and are seldom or never seen in the show pen, being such as are bred by, and produce in their turn, such specimens as those to be now mated. The chief difficulty, then, lies in procuring these mates for the exhibition specimens, which can only be done from a breeder, and hence the *quickest* way to produce good chickens is to procure a breeding pen, properly mated, from one breeder's yard. This can never be done except at a good price; and its success depends upon the character of the vendor, and his honesty in also giving correctly the exact amount of relationship there may be between the male and female elements of the pen. Without this knowledge, the new owner does not know how far he can safely carry in-breeding, or what dangers he has to guard against. On the whole, on this last account it is better to procure the two components, if results can be waited for, from different yards. The breeder knows then that he can start safely so far as relationship goes; and although his produce the first year will be uncertain, for reasons explained in the preceding chapter, as soon as he begins to re-mate from the produce things will mend, and his progress will be steady.

Good stock can rarely be picked up cheaply, but now and then it can, and the novice who has spent a year as advised will be able to judge for himself whenever such a bargain comes before him, in a selling class or otherwise. There are varieties in which second-rate stock will breed better than in others. Thus, Dark Brahma pencilling is so good now, that a pullet may often be picked up in a selling class good enough to breed really good chickens; while, on the other hand, in Spangled Hamburghs it will be weary and disheartening work unless a first-class specimen can be secured.

Summer Exhibitors to be Avoided.

One caution ought to be given, viz. not as a general rule to purchase chickens, however apparently good, which win at the very early autumn or late summer shows, or from breeders *who chiefly exhibit* at such shows. There are people who lay themselves out specially for such exhibitions, as the competition then is small, and winning with a certain quality pretty easy. The birds they exhibit are very pretty looking in most cases, but rarely large and fine, being hatched exceedingly early, when fertility and vigour are not at their best. They very often moult in their first autumn, after laying and breeding early, and are thereby debilitated by next spring, when really wanted for breeding; and even later hatched chickens from these regular summer exhibitors are produced from the stock when partly worn out by previous breeding. Of course no such rule is absolute: for instance, marking may offer of such an extraordinary quality as to override all other considerations; but the need for such a general caution is very real. One of the great shows of the year is generally the best time and place for a beginner to buy, and there he will meet plenty of breeders quite willing to sell; there also he can buy in actual presence of the best of the year; and there he has the best chance, short of actual visit to the yards, of picking up what he wants to know of family details concerning any purchases. An actual visit to a good yard is, however, the best way of all to purchase what is required. There relations can be pointed out, and the tendencies of the strain observed, and there can also be seen the faults which it is either safest to tolerate or most necessary to avoid.

Influence of the Sexes.

One or two guiding rules have been found to have very general application. It has been ascertained that the female has more preponderating influence upon size, form, and constitutional qualities; the cock upon colour, markings, neatness of comb, and eyes. One or two exceptions to this rule are, however, also general, mostly in giving more influence to the male. Thus, cushion in Cochins is a point of form, but has long been known to depend very largely upon its correlative point of saddle in the cock, so that a male bird too narrow in stern has often ruined the produce of a season. A characteristic head, or a small "blood-looking" head, is also a point of form; but seems to depend upon the male bird especially. In regard to general carriage or symmetry, as a rule the cockerels tend to follow the father's type, and the pullets the mother's. These facts assist in choosing between defects, some of which perhaps *must* be tolerated; but their general truth may be upset by some unusual prepotency of one parent. Such prepotency, or stamping power, depends usually upon previous consistent selection and in-breeding.

Ages of Breeding Stock.

In regard to the ages of breeding stock, no cast-iron rule will hold good. Amongst those who have bred many years the opinion is general that the finest fowls of the larger breeds, and especially those to feather most kindly, are produced by parents in their second season. Unless forced, however, which such birds do not stand well, these would often fail to produce early fertile eggs, and it is more usual to mate the cocks with pullets, and a cockerel with second-year or older hens. We have, however, bred Brahmas from young birds on both sides; and smaller breeds mature earlier, and are often so bred—in fact, the old Game breeders had a fancy for putting "youth to youth." But in regard to this much depends upon the time of breeding. Supposing fertile eggs are not wanted before March, and the sexes are kept separate until the beginning of February, and the pullets kept back from laying as far as possible, young birds, even of Asiatic breeds, will breed as vigorous stock as any, though perhaps not quite so fully feathered. It is when mated and breeding earlier, in an unnatural season, and forced accordingly, that immaturity entails some degree of weakness. When a mating has really "nicked" extraordinarily well, which sometimes happens, it is generally wisdom to keep the birds so mated as long as they will breed, or until the cock can be replaced by a son showing the same points. To what age fowls will breed depends much upon how they have been treated and to what extent their powers have been taxed. We have known of a hen breeding in her seventh year. An aged hen should not, as some suppose, be mated with a cockerel: such mating is generally too much for her, and may destroy any chance of produce, and a two-year-old bird is far better.

Number of Hens to One Pen.

This leads to the question of fertility, which must naturally depend much upon the number of hens allowed to one cock. Experience proves that the best number, for good results, differs enormously according to circumstances. It has been shown over and over again, beyond question, that want of fertility may be caused by too few hens, as well as by too many. We knew one case in which four hens with a cockerel gave very poor results, which were at once remedied by making them up to fifteen. No definite rule can be given, except that, as a nearly universal one, a cock on a good range may have at least double what could be allowed him in a very small run. In this country, in confinement, four hens is usually enough for a large male in a small yard, until warm weather comes on, when the more safe number may be five or six; on the other hand, an old cock in cold, wet weather may do better with three, or even two. For much also depends upon climate, and in America, during the normal season, less than twelve Plymouth Rock hens are rarely allowed to one male, which in our cooler climate might possibly be too much for, at least, an old bird. High feeding, as in America, also makes a great difference, and will do so wherever adopted.

Breeds also differ a great deal, and large combs may cause sterility, and call for dubbing to remedy this, as will be noted in its place. If hens appear worn-out and partially stripped, harm is being done, which will affect fertility as well as health. The lighter breeds of fowls are generally most fertile, and require most mates, unless the cock's vigour is affected by exaggerated comb. This matter is of importance to a breeder newly beginning, as he may only be able to afford, or to procure, one or two good hens for his pen. In that case the number should be made up by others, choosing birds, as before advised, whose eggs or else whose chickens can readily be distinguished. If this precaution is not taken, his one or two hens may be so overtasked as not to yield him half the result they should, either in numbers or vigour. Another expedient in this case is to separate the male bird except for half an hour morning and evening.

Fertility.

The established breeder also has much to arrange for in securing the all-important object of strong as well as fertile eggs. He will have learnt by experience how many females to allot at different seasons to his males of various ages; but he has also learnt the necessity for preserving sexual vigour for the breeding season. Some have carried this too far, and one writer has even advocated separating the male of a breeding pen at the end of April. We have seen the evil of this upon several occasions; thus to frustrate the natural instincts at their very height is a peril to health (even life in some cases), and does more harm by the fret and worry than it can possibly prevent. By the end of June this danger has much lessened, and if the male be then separated to lord it over a lot of young cockerels, he will be quite sociable and happy, recuperate during the intervening months, and be far more vigorous when mated again than if left with his harem. As a rule, he should not be thus re-mated until about four weeks before the first fertile eggs are desired and expected, and a little before this some animal food and iron tonic will be found of benefit, especially to adult birds. It should also be seen that he gets *enough* to eat, for many a gallant bird, if only fed with his hens, will not in their company eat eagerly enough to get his share. The cock in a valuable pen should always be felt frequently while roosting, and if he is getting the least thin or light should be carefully given extra food by himself, but, of course, avoiding gross fatness. Birds are not all alike in this respect, and only feeling their condition can ensure that they are sufficiently supported. In no case should a bird be mated until quite through his moult. With one thing and another, the end of November, or "after Birmingham," is a very usual time to mate up pens destined to give fertile eggs for the New Year.

Vigour of Females.

It does not seem quite sufficiently recognised that the hens need conservation of their breeding powers as well as the cocks, and should be equally considered in relation to the time when their eggs are desired for hatching. When very early eggs are planned for, as in order to hatch on New Year's Day—the earliest legal day for chicken-showing—it is a heavy tax on both sexes, but many people appear to forget that the female system is liable to exhaustion equally with the male. High and careful feeding will effect wonderful results in maintaining both production and vigour, as shown by constant and heavy duck produce during the early months. But there are, nevertheless, many proofs that by early spring—the best time for prize stock—the produce from birds which have already been breeding for months is not equal to that from parents which did not begin till nearer the natural season. This is, in fact, the chief great reason—far more than in-breeding—for the decline in vigour of much prize stock: it is produced from parents already worn out by previous production. It is also one reason why the produce of grown hens, which lay later, and nearer the time when the real work of breeding is done, is often stronger and better than that of pullets; the pullets have been laying and partially worn their strength out, when the hens are only freshly beginning. A breeder should therefore "nurse" his best birds, so that they are not taxed till as near as possible to the time when he really wants their produce for his own yard. It is also for this reason that moderately late pullets, hatched in April or early May, produce the finest stock, if kept back a little so as not to lay till the winter is fairly advanced. Very early breeding may be necessary for early chicken showing, and other purposes of the high-class breeder; but it should be clearly recognised that it has necessary evil results, and most of all in its effects upon size and vigour. Hence the stress we have laid upon not obtaining first breeding stock from those who chiefly support the early chicken shows.

Sometimes special measures are necessary to ensure fertility. Extraordinary fluff and heavy vulture hocks very often interpose mechanical obstacles to successful intercourse. In that case cutting the hocks short and con-

Special Causes of Infertility.

siderably trimming down the fluff will make a marked difference in the produce. The excessively large combs, now bred so often in Minorcas, Leghorns, and sometimes Dorkings and other birds, also cause a great deal of sterility. In such cases dubbing at once remedies the mischief, which is common among breeders of these varieties who do not know the cause. Many experienced breeders systematically dub all their breeding males of these varieties, as soon as the exhibition season is over. A very cold and at the same time wet and dull winter is peculiarly prejudicial; this is often helped by iron tonic and a little cayenne, or even by a few drops of tincture of damiana daily. Sometimes one particular season will be mysteriously and generally distinguished by widespread infertility. The year 1899 was unusually remarkable for this in America, and only less so in England also. In the former country many breeders, who usually sell thousands of eggs, were obliged to withdraw them from the market, and complaints came in from all sides; the calamity was as prevalent amongst Leghorns as in the larger breeds, and extended to the middle of June, after which things mended. Opinions as to the cause were various. The only explanation we can give is that the season was a dry one; and we had occasion to notice about twenty years before that a very dry season, especially if accompanied by dry feeding, had on that occasion also been accompanied by wide complaints of barren eggs, which must be distinguished from poor hatching.

Control of Sex.

A point to be considered in regard both to the time for breeding and the composition of the breeding pen, is the *sex* desired in the produce, concerning which the breeder has on an average (with, of course, numerous exceptions in detail) some measure of control. Of course, he will rather desire pullets in pullet breeding pens, and *vice versâ* in most cases. As a rule, also, cockerels require quite a couple of months more growth to bring them into full feather for exhibition than pullets do, especially in the larger breeds, which take longest to mature. In small breeds chickens mature more quickly, and cockerels are less behind. Thus a breeder likes to get his exhibition cockerels out earliest, and large cockerels earliest of all. Now amongst the larger Asiatics it has generally been found that a vigorous cockerel mated to three or four adult hens in winter produces a high proportion of cockerels in the early broods, this proportion diminishing later. With an adult cock mated to three pullets, pullets more predominate, though sometimes, if the male is unusually lively, cockerels will be numerous there also. If there are more pullets than three or four, and the eggs are fertile, the pullets are usually in the majority; but here, also, there are usually more cockerels in the early broods than later. When young or adult stock is mated together the result is impossible to predict, save that experience seems to show that the more vigorous the stock and the fewer the females (so long as evil is not produced), the greater on an average the proportion of cockerels. Of the small breeds we have little personal experience, but the broad results will probably be on the whole similar, with a somewhat higher number of females to one male. In regard to the larger ones, however, such facts suit the breeder very well, as he can easily get a few of his early moulted hens ready for early laying, while a cockerel will ensure him fertile eggs for his earliest cockerels; and the rest, with his pullets and older stock birds, will come on later for his other champions, and provide progeny not weakened by too early breeding.

Season and Bodily Character.

Time of hatching has also some influence upon the bodily character of the produce. Early hatched cockerels from adult hens are usually fully furnished in tail and hackles, and of good stature. On the other hand, chickens hatched really late in the season—say at the end of May or June—are, as a rule, less well supplied with feather, and very often also more *short legged* in comparison. Occasions sometimes occur when these facts may be useful.

Further Breeding Operations.

The first year's produce from newly purchased and mated stock may very likely prove of a most disappointing character. It is not always so, since among the best breeders there is now generally some amount of blood common to all, which prevents the worst results, such as were frequent in earlier days. But, as a rule, the reversion caused by the fresh cross will be but too evident, and only a minority of the first year's produce may be fit to use. These will now have to be mated up again, according to the principles explained in the preceding chapter, and thus the new breeder will go on to form his strain; but he will be no longer a novice, and no more need be added with reference to such a stage of experience. Mr. Felch's chart, with what has been said in connection with it, will explain the methods by which line breeding can be carried on for years without injury. He has only to remember that *any* point, bad as well as good, and weakness of constitution as well as anything else, will be intensified by line breeding just as surely as the points he is seeking to breed, unless he rigorously discards specimens which manifest them. It is by such signs that he knows when "fresh blood" really may be needed. If health or size is failing, or if some fault persists in appearing, so that he cannot find mates altogether free from it, then he may need a fresh introduction. Here, again, the first produce will probably disappoint him, and it is the second season of his cross, after "breeding back" that produce to his old strain, which gives him the real result of his work. We need only add that in the earlier stages especially, whether of a new strain or after any fresh cross, the more severe he is in rejecting all but such as come up to a very high standard, the quicker will be his progress, and the higher percentage of really prize-winning stock will he get in the end.

Care in Yearly Matings.

Every year, of course, the more experienced breeder devotes most painstaking consideration to the *mating* of his birds for next season. Weeks, or even months, before actual pairing he begins to think about "what he shall do." He thoughtfully scans his best chickens, as their good points or their deficiencies become manifest to him; and if certain predominant failings are too apparent, he tries to trace out the bird or the mating to which they are due. This tracing *back* of faults, if possible, is all-important, for everything of the sort has some definite reason. He may think that he must have a cross, or he may decide that his own stock provides all that is wanted: but all is conditional until the Palace, or Birmingham, or other show which to him sums up the results and record of the year. He may have been rather disappointed with his own stock, to find at the show that some falling back is general, and that his best birds are as good as any others. Or he may have anticipated victory, to find some one else has so much better that, if he can afford it, he determines to buy at any price. Or his champion bird which he depended upon may be "claimed" at a big price, and his plans so far upset. When all his actual material is selected, be it at home or from outside, no pains are spared in the final mating-up. Sometimes a point previously overlooked will suddenly strike the eye, and take a given bird out of a breeding pen at once, perhaps to go into some other. Of course one grand rule is that no fault should be present in *both* of a pair.

Experimental Changes of Mating.

What adult birds have done already is also to be considered; and with a view to that, it is not a bad plan, when a pen has not seemed to "hit" well, to change the mating and hatch a few thus bred late in the season, when the main breeding is over; these chickens will be no use, but serve to show what the effect of the different mating has been, and if good this can be repeated the next season. Except for such a serious object as this, however, and at a time when the first ardour of the birds is exhausted, birds once mated up should not be disturbed, nor capricious changes made. Such may entail disaster. Even fowls often form strong attachments in their way, and a cock separated from his mates and put to others may not infrequently turn sulky and thrash his new wives, instead of paying them proper attention. If this occurs as the result of emergency, it may sometimes be remedied by smearing a little oil of aniseed over the plumage of the rejected or obnoxious hens; but the wise breeder will, unless actually obliged, leave his birds in peace. Even removals often upset fertility and vigour a great deal; and of the folly of exhibiting brood stock when once put up we have already spoken.

Duration of the Male Influence.

This leads to the important question of the duration of the cock's influence over hens with whom he has been mated. Many experiments and observations upon this head have shown that there is no absolute or definite rule. The most general one appears to be that if one male is directly replaced by another, about the fourth or fifth egg afterwards usually shows the change of parentage. We have many records to that effect, both from English and American sources. We have also records of about half a dozen cases in which the cock was simply removed, and after from four to eight days the eggs became clear; these being chiefly of the larger breeds. The latter fact may possibly be significant, for we have also records of cases in which the male's influence lasted much longer, these being chiefly amongst the smaller and lighter breeds. Game breeders found, as a rule, that after a cock's removal all eggs were fertile to the end of the "batch," and even a Cochin is reported as laying sixteen eggs after separation, of which fourteen were fertile. Of many such records another which has reached us is that of a Leghorn cockerel, which was taken away for roup on March 29, 1899. As eggs had only been laid for a few days then, his stock was much desired; all laid after were saved, but none could be set for a fortnight, incubators not being used. The earlier ones hatched freely, though so stale; later, fertility *gradually* fell off amongst them, until of the last lot set, which were laid a month after separation, and set a month after laying, none were actually hatched; but five even of these were fertile, and lived in the shell till about the ninth day.

In regard to change of parentage, results give similar discrepancies with what we have stated as the general rule. Two Spanish pullets having been running with a Spanish and a Cochin cock, no eggs were saved till six weeks after separation of the Cochin; yet the chicks had still feather on the legs. A Brahma hen taken from her mate and put with a Hamburgh, bred pure Brahmas for ten days, then half-breds. We have other cases wherein the former parentage has been manifest for from one to three months. There is no reason why such anomalies should surprise us, when we consider how susceptible the reproductive system is of modification; so that, for instance, one breed may lose the instinct of incubation, whilst another develops it in extraordinary degree. We know that one visit to a turkey-gobbler fertilises the whole batch of eggs laid by a hen turkey; and after beginning to lay she, as a rule, avoids the male bird. The hen does not so avoid him; and the inference is that his company is more or less necessary. When, therefore, we duly remember that we have multiplied natural egg-production tenfold, we need not wonder that there should be no uniform rule about these phenomena. Differences may depend upon the breed, the vigour of the male, the number of hens with him, and the period or stage of her "batch of eggs" at which union or separation takes place, as also upon the *definiteness* in number of such a batch or laying of eggs, which is more defined in most Game fowls than in the forced laying breeds. On the whole, however, from three to five eggs, or a week in time, will generally be sufficient to ensure the parentage for practical purposes.

Influence of Former Matings.

There may, however, be more at stake than direct actual parentage. Here we are on less certain ground, and discussing supposed facts which are disputed altogether by many breeders, and on which opposite opinions are expressed by some scientific investigators. But there is a large amount of presumptive evidence for the belief that in a sense it is possible for a chick or other animal to have *two fathers;* not to be the offspring solely of the actual parent, but to be also influenced by previous unions with the mother. Doubtless much of the alleged evidence is open to all sorts of objections: nearly all the evidence of practical breeders is so. But most experienced breeders who have really managed their own yards, not leaving them to others, believe in the occasional more or less permanent results of previous undesirable alliances, and take strict precautions that their most valued stock is not exposed to such. We can only allege one experience personally, relating to one of several Dark Brahma pullets which were reared for us on a farm. One of these was frequently producing traces all next season, and may have done later, for all we know, of a common dunghill cross there experienced by all of them. There were no signs but in the produce of this one, and such rarity and uncertainty may well account for differences of opinion. The late Mr. Frederick Wragg related to us a very similar experience of his own. It is much more difficult to understand such consequences in the case of birds, where the germ is quickly enwrapped in an impermeable shell, than in that of mammals, where a half-bred offspring is for months connected by direct blood-circulation with the mother; but it is at least better to be on the safe side, and not allow a valuable pullet to be contaminated by undesirable society.

Influence of the Imagination.

Equally disputed by many is another influence, which we are personally quite convinced of, and which may indeed be possibly a cause of that just alluded to. It is that of any strong impression upon the *imagination or sight* of the birds. It is difficult to see the point of some sneers about Jacob, which have been worded in certain cases as if his results were ascribed to special Providence; on the contrary, the whole is simply related as the crafty expedient, with more or less result, of an experienced and successful flock-master. We were convinced by what seemed, and still seems to us, the conclusive case, personally known to us, of a breeder of white Cochins at Bristol, who also kept some Minorcas for further egg supply. He got many chickens with black splashes when black hens were added to one of his pens, and on removing them the black splashes ceased. He was so struck by the coincidence, that he repeated the experiment again, with the same results. Here, too, *all* the chickens did not come with black splashes by any means, and in this diversity lies endless room for doubt and contradiction; but he and we were both convinced, once for all. We also acquired the conviction, when first breeding from a heavily hocked Brahma cockerel, that after cutting his hocks quite short (done in the first place merely for fertility) the percentage of hocked chickens, not then allowed for exhibition, decreased by an evident, marked percentage. Doubtless any such phenomena are various and uncertain, and offer ready occasion to County Council lecturers for cheap ridicule ; but nearly all practical breeders have come to believe in them, and again it is well to keep on the safe side.*

Care of the Chickens.

We turn now to the chickens themselves. In regard to feeding, there is nothing to add to what was said in Chapter VI., except that cheapness of any food takes a very secondary place in the case of prize stock, and as there can be no doubt of the superiority of oatmeal and ground oats as food for obtaining size, wherever that is valued these should be mainly used in preference to cheaper substitutes, though such may come in as changes. Oatmeal alone mixes up hard, but a little biscuit-meal added will make it friable, and be also less dry ; dry meal stirred with boiled porridge is also greedily relished. It may be well to remark that such choice of food and care in giving it is of great effect in restoring size and bone to a strain which has degenerated. Thus, let pencilled Hamburghs, which have become almost Bantams through long in-breeding for narrow pencillings, be carefully subjected to such a regimen, and size may be recovered by feeding alone, to a very perceptible degree.

Prize poultry are not reared by people who lie in bed in the morning. The chicks must have their first meal as soon as it is broad daylight, and for the earlier broods there is no better material for it than Mr. Douglas's custard squeezed from the whey, mixed perhaps with a little oatmeal. In some yards the incubator wasters will furnish eggs for this ; if not, a drink of hot milk goes a long way, with the breakfast, which in this case is perhaps best of porridge and added dry meal. What is needed for rapid growth is a first meal quickly digested, so as to allow of keen appetite for the next one. The extra feed at night, by lamplight, has been already treated of, and we only add here that this early and late feeding has a bearing upon size and vigour which does not seem generally understood. The object is not, as some suppose, merely to get in an extra meal. While very young it has that effect, but at a later period, supposing that a stage when four meals a day are deemed best has been reached, the lengthened time between first and last feeds will enlarge the time between each two meals, and shorten the night interval, which is longest of all. Meals thus more divided are better assimilated, maintain keener appetite, and result in better growth.

Use of Phosphates.

We have already mentioned the use of bone dust or dry bone meal, and its beneficial effects. In deciding for or against its use, the postponement which it causes of the final make-up of the bird must be taken into account. There is another way, however, in which phosphates can be added to the food of any young stock in which experience has shown that leg weakness is to be dreaded, and it cannot be too well remembered that this ailment is more easily guarded against, than cured when it actually occurs in any marked form. This is to add to the food (which is better than with the water) a little of "Parrish's Chemical Food," a syrup of the phosphates of lime, iron, and soda. A teaspoonful may be added to each feed of soft food amongst a dozen chicks a fortnight old, or half a dozen at the age of three months. The effect is most marked in cases which require it, and this valuable medicine, since we first introduced it to poultry breeders in 1872, has well established its merits all over the world. So incontestible have these been, in fact, that they have led to the use of Parrish's Food occasionally in a manner simply ridiculous, for *acute* ailments, such as rheumatism or cramp. It is of no use whatever for such cases. It is essentially a slow-acting method of *feeding phosphates* to a system deficient, or known from experience to be likely to prove deficient, in them, and acts solely by the long and gradual assimilation of these ingredients. Its effects are seen only after weeks or even months, not after hours or even days.

Condiments and Stimulants.

Such additions to ordinary dietary, which may or may not be advisable, owing either to delicacy in prize stock or greater size desired in it, lead us naturally to the question of condiments or spiced foods, so widely advertised as specially beneficial to stock of this kind. The question is a little complex, and it is not so easy to state the truth in a way unmixed with error. There is no doubt that fowls on a wide range, and especially in the tropical jungle which was the original home of the species, eat much of the leaves and fruit of heather and other wild shrubs and plants of an aromatic nature, which give the well-known aromatic flavour to our "game" birds. Such merely aromatic principles, in moderation, cannot be injurious, and it is common experience with ourselves that they aid appetite and improve digestion. It is universal experience, also, that the occasional judicious use of more stimulating spices is often of great service, and, on cold or wet days especially, may prevent or obviate ill-effects in either very young or older stock. To give really stimulating condiments continuously, however, is like giving medicine regularly to a healthy man, and, like that, any effect at all can only be a bad one as regards health and vigour. Such treatment, with ample nitrogenous food to support it, may indeed force a pullet into earlier and more profuse laying, which is legitimate in a bird meant to be so used up as quickly as possible. But though that may be profit, it is not health, and health is what we want in rearing prize poultry.

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* It is worth noting here that during December, 1900, some interesting correspondence bearing on this subject appeared in the *Lancet*. One medical gentleman related a visit to a professional friend, a cup-winner with pigeons at the Crystal Palace. One of the divisions of the latter's loft faced a lawn generally covered with white linen being dried ; and the inmates of this pen, whatever they were, were specially subject to *albinism*. It was also found that some Turbits and Owls next to a pen in which Pouters were kept were more or less subject to Pouter markings.

The general conclusions must be that real stimulants should not be given constantly; that those for special occasions should be adapted for those occasions; and that any stomachic condiments, designed for more or less constant use, to supply the lack of what a wild bird would pick up, should be of the milder aromatic kinds. As the composition of advertised compounds is not published, the only guide to selection that can be given is to avoid for any regular use such as to the taste are very hot or astringent, choosing rather the mildly sweet and aromatic, while the hot and astringent may serve for special occasions. No one can be equally good for all purposes, so far as we can see, and we give here certain prescriptions which have now been tested for many years.

Suppose, first, that a change in the weather has produced symptoms of a decided cold amongst some of the birds, but slight, and not appearing to demand any strong treatment; then the following would be a suitable condiment to mix in the soft food of all, the ingredients (as in all other cases) being carefully powdered and mixed by a pestle and mortar, and sprinkled a little freely:—

1.	Liquorice	2	oz.
	Ginger	2	,,
	Cayenne Pepper	1	,,
	Aniseed	½	,,
	Pimento	2	,,
	Sulphate of Iron	1	,,

Here the liquorice, cayenne, aniseed, and iron are chiefly active, the ginger and pimento (allspice) tending to rally the digestive system, which is apt to be a little affected. Suppose next that we have wet or cold weather, likely to last a little time; to guard our young birds against it we may use:—

2.	Cinnamon	1½	oz.
	Ginger	5	,,
	Gentian	¼	,,
	Aniseed	½	,,
	Carbonate of Iron	2½	,,

We first published this in 1872 as the prescription of a French apothecary, Mr. Mills, for turkey rearing; since then it has been more and more widely used in France to bring turkey poults through the critical period, and for moulting, and it has been within recent years recommended for bad moulting seasons by Dr. D. E. Salmon, the well-known American authority upon poultry diseases. For more continuous use the following is as good as any:—

3.	Cascarilla Bark	2	oz.
	Aniseed	⅓	,,
	Pimento	1	,,
	Malt Dust	2	,,
	Carbonate of Iron	1	,,

Here there are no strong stimulants, but solely more or less carminative aromatics, with a little malt dust and iron. This powder may be mixed with three or four times its bulk of sugar, or as much more of malt dust, at discretion. With either addition it is sometimes useful during the last few weeks before exhibition, helping to fill out a little, and being much relished by the birds. Of the mixture as it stands above, just enough should be stirred in the food to give a slight characteristic taste, and no more. Of the No. 1, if wanted for a cold, as much as will lie on a sixpence may be mixed with a little butter and flour, and given as a bolus or pill.

Meat or Cut Bone.

The question of meat, or later on green cut bone for prize chickens, or the quantity to be given, must be answered differently according to circumstances. A diet mainly of groats and oatmeal, with grit and bone dust, without appreciable animal food, except insects and worms, will rear chickens of very large size, but takes time, and they will be slower in maturing. Animal food given pretty freely, but not excessively, also promotes size, and pushes the birds on much faster and with fuller furnishing in plumage; hence such a diet is so far preferable, and numerous careful experiments proved that the same results cannot be got by any dietary of purely vegetable products, even though made up to as high a nitrogenous ratio.

But free meat or green bone feeding is undoubtedly a cause of increased growth in comb, leading to coarseness, falling over, and other faults in that member. If, therefore, small neat combs are desired, as in Brahmas, Wyandottes, or Hamburghs, or if the breed has tendencies to crooked or falling combs, as in Minorcas or Leghorns, much meat may be very injurious, though on the other hand, it may be advantageous in promoting the large falling combs of the females in the latter races. Great excess sometimes has another and very curious effect. In America the large quantities of blood from the great slaughter establishments are dried and granulated, and sold as dry "blood meal," which causes rapid growth, and on that account is sometimes fed in large quantities. We have collected quite a number of instances in which such feeding has been followed by an extraordinarily heavy growth of feather, even to an extent that has so overtaxed the bird as to cause death: chickens have been reported which were dying off daily at two months old, covered by an extraordinary growth of feathers. In other cases results were less fatal, though the increase in plumage was marked; and inquiry in England has elicited evidence that free meat feeding, on a somewhat less scale, has also been sometimes noticed to cause hastening and greater abundance of plumage. There are cases in which this effect might be turned to advantage. However, meat or green bone feeding must always be watched in regard to its effects in enlarging comb, which cannot be remedied if once allowed to reach an injurious extent. Later in this chapter we give a warning as to its results upon laying pullets.

Sunflower Seed.

The best of all substitutes for actual animal food is sunflower-seed. It appears far better assimilated than other highly nitrogenous foods of the pulse kind, and the large quantity of oil promotes furnishing and good condition of feather. Where meat is inadmissible, this seed may be of service, and many poultry-breeders would find it worth while to grow a portion for their stock. As a crop, the produce is variously stated. Some report a return of fifteen quarters from an acre; the *Board of Trade Journal*, in printing a report on this crop as grown in Russia, where it is cultivated for the oil-mills, states that an acre requires about 20 lbs. of seed to sow, and should yield about 1,600 lbs. In Russia the peasants eat the seeds as light refreshment, which is another illustration of their excellent quality, and of the reasons why poultry are so fond of them. Land for this crop should be ploughed in autumn and harrowed in spring, the seed being sown in April or May in every second or third furrow, or say in rows three feet apart, the seeds a few inches distant, or it may be very thinly broadcast, so that every seed has two or three square feet to itself upon an average. Poultry manure suits it very well while growing. For a smaller quantity, some prefer to start in hotbeds early in March, and plant out early in May. One caution should perhaps be added. *Rats* are as passionately fond of sunflower-seed as the fowls are, and wherever it is stored they are apt to come about the place. It should only be kept in iron receptacles, and special care taken to leave no loose grain about the floor.

Care of Combs.

The combs of many breeds require care in other respects than avoiding excess of animal food. Heat is quite as injurious, so that two days in a hot gas-lit showroom will sometimes "draw up" the comb of a bird apparently mature and safe, and ruin it for ever. In all cases where combs are wanted small and neat, as in Brahmas, the chicks should therefore be brought up in cool and airy sleeping-places as soon as taken from the mother, and not allowed to get overheated or sweated in artificial brooders. The same applies even more to single upright combs, which must be kept straight, as in Leghorn cockerels; but these in addition should be taken from a hen, if so reared, before the combs get any height. If this is not done the mere pressure of the hen's body tends, during the youngest and most susceptible stage, to bend over or twist the comb. Brooders which have any nestling material in contact with the head are injurious for the same reason. To take the chickens' heads out of danger early, and rear them with plenty of room in a cool though not chilly brooder or other sleeping-place, makes a great difference to this type of comb. Rather later, when the combs are growing fast, if there is reason to fear disaster it is often of the greatest service to sponge the comb gently every night with hazeline tincture, or to smear it with hazeline cream. This is not only a mild though effective astringent, but has a specific action in repelling congestion of blood to the part where applied, and will help much to keep a comb firm and within bounds. It is of course only *before* twists or thumb-marks actually appear that such means can be of use. A slight twist, if treated at once, can sometimes be cured by affixing a stiff piece of cardboard on each side, with sufficiently adhesive material, and pressing close. A Spanish breeder we knew used as cement, material scraped from Alcock's Porous Plaster, which he said "held" better than anything he had tried. If the card is varnished on the outer side with French polish, it will be stiffer and not get soft. Combs actually fallen over belong to a later stage, to be dealt with in our next chapter.

Another deformity has been much more common since artificial rearing became so general, and should be guarded against from the first. We refer to curved or crooked toes,

Crooked Toes.

the middle toe especially curving round instead of being straight. This has thrown many an otherwise good bird, and is generally due originally either to a smooth hard floor in the rearer, or later, to perches too broad and flat, or a shelf with too little bedding. Newly hatched chickens are sometimes ruined for life even in the drying box, the two limbs slipping apart on a smooth floor, with consequent strains which are never recovered from ; many knock-knees and loose hock joints are also caused in this way. But the more common result is crooked toe. The nail being unable to sink into the floor, raises the toe near the point ; and to avoid slipping, relieve strain, and get more "grip" on the ground, the toe turns rather sideways so as to lie on the floor. We have seen many a brooder and rearer with wooden or zinc floors, and a mere sprinkle of peat moss or other litter which slips about loosely, allows the claws to reach the smooth hard surface, and is of no real assistance except to cleanliness. Enough material should always be supplied to *lie* firmly as a bedded floor ; not so little as to be blown about with a puff of air. On this the chickens can walk firmly and comfortably, the toes not being strained ; and if later on such as roost are given perches which the claws can really *grasp*, without being stretched flat, there will be very few cases of this annoying disfigurement. Some advise curved toes to be treated by binding them to splints, and appliances are even sold for that purpose ; but this belongs to a class of advice and treatment chiefly given in display of pretended superior knowledge. We have known such means faithfully used on various occasions, but have never known a case cured yet ; and a moment's thought must convince any breeder of the injurious effect of binding or fastening into one rigid line, members meant to be flexed and reflexed at every step. We have known disease of the hock joint to follow from such unnatural proceedings, but not the cure of the crooked toe.

A Cause of White Feathers.

We have mentioned overcrowding in a brooder as apt to cause overgrown combs at a tender age ; it has in some varieties a marked effect in another way, causing the appearance of *white feathers* in undesirable places. Many in England have suspected this result, in Brown Leghorns especially ; but in America, where this breed is often reared in large numbers, the fact has been established beyond doubt. One breeder reported that whilst chicks reared by hens were all right, those in a large brooder had white feathers on their backs and breasts as well as wings ; others have found that where a few in a brooder kept sound, others more crowded, from the same stock, would show white in nearly every chicken. Some think the reason is in greater liability to vermin ; others that the tender young feathers are bruised by close contact ; others that it is a consequence of general loss in vigour. The main point is the fact, which should be kept in mind.

Necessity for Records.

There can hardly need any reminder of the absolute necessity for a *stud book*, in which the parentage and descent of every chicken hatched is carefully recorded for present and future consultation. It is a great assistance if all the males used, and at least the best of the hens or pullets, have names given to them ; or one family may have one common name, and the individuals be distinguished by numbers, as Bates did with his Duchess line of Shorthorns. If the breeder also sells eggs, sending them out honestly from the same stock he himself uses, he will record particulars also in his register of *egg sales*, if he is a wise man. We reproduce from the first edition of this work the following specimen, because in all but the proper name it was an actual transcript from our own egg book of 1870, which is now destroyed. We were breeding from three cocks that year, and the pullets Princess and Countess were the pick of the females in our opinion.

April 10.	MR. JOHN SMITH, Blankville, Blankshire.	10[*]
	3 Goliath (1 Princess), 4 Uncle Sam (2 Countess), 3 Sambo.	
May 2	Result—7 ; (1 Uncle Sam and 2 Goliath were clear).	

The result of the sitting is very often stated, as it was in this case by the purchaser on May 2, and generally the names are reported also, as here, if marked on the eggs. The possible advantage of all this will now be very obvious. Suppose, as is possible, we had very bad luck ourselves from Uncle Sam, who is perhaps too old to breed again, and that in December Countess is either dead or sold, and we seem "out" of that strain, and want it. Looking over the egg sales book, we find Mr. John Smith must have had one, and may have had two chicks from the best bird in Uncle Sam's pen ;

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[*] From experience, we never allowed a purchaser more than ten Brahma eggs in any one sitting. It was the same number we used ourselves. Incubators are of course quite another matter, but were scarcely used then.

and if he reared them we stand a good chance of getting back at a fair price a bird which circumstances may then have made invaluable.

Marking Chickens.

Of course the chickens, as they grow, must be marked in some way, or all this is useless. Those hatched in incubators can often be identified in regard to mother as well as father, but if such identity is to be preserved it must be marked at once. The readiest, and perhaps the most simple, means for this is by what is called "toe-punching," but which is really "web-punching." This consists of punching small round holes in the web of the feet, and is easily accomplished by the aid of a special appliance that may now be purchased of most manufacturers of poultry requisites. By this method a reliable record of the produce of each individual hen in the breeding pen may be kept; and if each chicken is further "leg-banded" with a numbered ring, first at the age of three or four days, on attaining the age of three or four weeks, and again on attaining to adulthood, it can always be identified. "Toe-punching," which is not cruel, as some believe, since the web of a chicken's foot is by no means sensitive, should be done soon after the bird is hatched; and should the hole become blocked, which will be an infrequent occurrence, the process must be repeated. If, however, the hole is cleanly punched, it is practically impossible for the web to grow together again. A chart of the combinations of hole-marks must be made, and kept for reference. Many such combinations will suggest themselves, but the following will be found quite sufficient for ordinary purposes: One hole in the left web of the left foot; one in the right web of the left foot; one in the left web of the right foot; one in the right web of the right foot; one in the left web of both feet; one in the right web of both feet; one in the left web of the left foot and one in the right web of the right foot; one in the right web of the left foot and one in the left web of the right foot; one in each web of the left foot and one in the left web of the right foot; one in each web of the left foot and one in the right web of the right foot; one in the right web of the left foot and one in each web of the right foot; one in the left web of the left foot and one in each web of the right foot; one in each web of the left foot and the right foot blank; the left foot blank and one in each web of the right foot; one in each web of both feet. The diagram given above, taken from *The Encyclopædia of Poultry*, explains possible combinations of this kind very clearly.

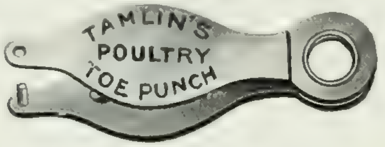

Fig. 76.—Chicken Toe-Punch.

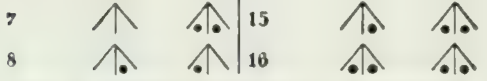

Fig. 77.—Possible Variations in Toe-Punching.

Another method is one we saw practised by an ingenious breeder who used nothing but artificial brooders. He kept by him an assortment of Judson's dyes (a set of any aniline colours would do), and each chick, as soon as dry, received a dab of colour on the down; with light chickens the back or saddle is a good place, with dark or striped ones the head or the stern may answer better. These colours give ample variety, and are distinguishable for several weeks, when the chickens are larger and hardier for more permanent marking. Single rings round the legs give *four* categories, as applied to the right shank, left, both, or none; two rings will give many more varied with one. Such rings are easily applied in the shape of a bit of coloured worsted, or of tea-lead, or soft tin wire bent round quite loose, but so that it does not slip over the foot. Pedigree rings of various patterns, to which a number can be affixed, and also coloured celluloid rings, in which a variety of changes can be obtained, are also procurable. Examples of two forms of marking rings are given herewith through the courtesy of Mr. W. Tamlin, of 7, St. Margaret's, Twickenham. The metal pedigree rings (Fig. 78) are non-corrosive, and their interlocking fastening prevents dropping off. They require alteration at two further stages of life after the first ringing of the chicken, namely, at a month old and when ready for the adult rings. Cheaper and more generally in use now are the spiral celluloid rings (Fig. 79); these are easily put on or removed, and do not drop off. With these coils, as in toe-punching, a number of changes can be rung by means of the various colours and ringing on either left or right leg, or both legs. The addresses of appliance makers like Messrs. Tamlin, Craven and others, who make these useful helps to breeders, can always be found in *The Feathered World.* A development of the spiral ring in the form of a plain expanding band of celluloid, capable of being numbered, embodies a further help to careful pedigree breeding.

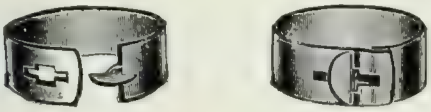
Unfastened. Fastened.

Fig. 78.—White Metal Pedigree Rings.

Separation of Sexes.

Shade, and change, and fresh ground, and care according to the weather, have already been treated of in a preceding chapter, and it only need be added here that the *separation of the sexes* should be carried out early in prize stock; the smaller the runs the earlier should this be done. Our own opinion always was that, in most breeds, the best results were obtained on moderate grass runs with sufficient shade. In large numbers on unlimited grass the condition and plumage are of the best, but large breeds are apt to mature too quickly and not grow so large; without any grass, it is more difficult to get gloss and hard feather. Breeds like Game and Hamburghs, however, do best on unlimited range, if it is available. Large Asiatics need not be separated till ten weeks old or even a little later; but with the smaller and more precocious breeds, the sooner the better after they are removed from the hen or the warm brooder. It may not make much difference to ultimate size in their case, but they become precocious and lay early when left together, and are ruined for the later and better shows. The sexes can generally be distinguished at an early age, and many experienced fanciers can with almost absolute certainty differentiate between the males and females of a brood of chickens on the day they are hatched. As a rule the heads of cockerels are larger, carried higher, and look bolder, with larger combs, the whole carriage being loftier. In most breeds our experience also is that the pullets fledge most quickly, especially on the back and down the breast. With buff, black and white Orpingtons and white Wyandottes, it is often difficult to pick out the cockerels until the appearance of the saddle hackles. In Asiatics and some other breeds we have noticed that the first wings of the little cockerels are generally narrow and pointed and more of a self colour, while those of the pullets are broader and rounded at the end, and with more pencilling or marking. No one sign is infallible, but generally a true judgment can be formed.

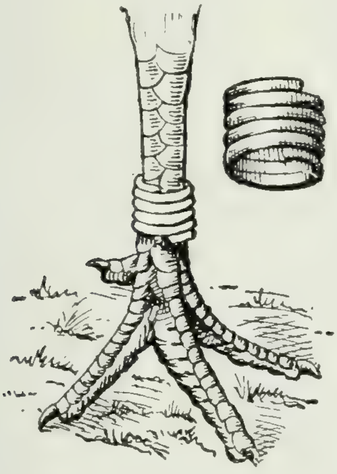
Fig. 79.—Celluloid Marking Ring.

Weeding the Stock.

The same period is convenient for "weeding," or looking the chickens over and picking out those which are only good enough for killing. Happy is the fancier who has but few of such!—though with every year the proportion should decrease; but, at commencing, the proportion of such "wasters" will almost inevitably be very large. This is a point in which all beginners fail, without exception. They do weed out and kill just a few of the worst; but the rest, they think, do not look so very bad, and perhaps may improve; and so they are kept on, crowding the yard so that there is neither fresh ground nor fresh air for what good birds there may be. Now the beginner may make up his mind that only his very best fowls will have the slightest chance; and that to keep all these birds alive destroys what chance he has, besides "spoiling his eye." If he knows enough to really select the best *quarter* of those he has reared past chickenhood, he may be absolutely certain he has retained more than all really worth keeping; and those few will grow into finer birds for such severe weeding, to which the experienced breeder with limited space always subjects his yard.

Where grass-run is unlimited this does not much matter, and chickens may be kept without much detriment till full grown for table use. But the owner of a limited yard, who wants to make and maintain a reputation, cannot afford this. The matter is very simply illustrated. Let us suppose he can manage to rear really well for the show pen two dozen full-grown chickens, and no more, besides what adult stock he must hold over for next season's operations. A novice will probably hatch about forty, and after losing half a dozen, weed out barely a dozen more of the worst. He cannot expect much from the rest, for the first year or two. But the experienced breeder, even with better-matched stock, would act differently. He would hatch at least sixty, and very likely eighty, birds, killing a fair proportion as soon as their very first feathers, at a fortnight old, told him they would be no good; and then, at a still early period, he would kill *half the remainder*. Keeping only the pick, he can hatch more. Later on, when his breeding has become more certain, he can be less severe; but experienced breeders will weed out much earlier and more severely than novices can find it in their hearts to do. Another reason for doing it pretty rigorously is that a run containing only pretty good birds has a wonderfully more pleasing effect than another consisting partly of inferior specimens, and also assists in that training of the eye to *perceive and demand excellence*, which is perhaps the real secret of permanent success. In each Standard of Perfection that accompanies the descriptive text on the respective breeds, a list of defects which disqualify a bird as an exhibition specimen is given. This the novice poultry fancier should peruse carefully ere commencing his first "weeding," since these defects are generally apparent at an early stage of a fowl's development.

The chickens thus drafted should also be sorted into lots of approximate age; especially should a young lot of cockerels not be introduced amongst an older lot already possessing the ground. They would in that case never be free from persecution, or get their share of food, and the wings of Asiatics would probably be spoilt. First possessors generally remain masters of a run, therefore all its intended tenants should be introduced together. All will then shake down speedily, and if a full-grown cock can be turned in with a lot of cockerels, it will be all the better.

Colour of Newly-Hatched Chickens.

There are few subjects less understood by the beginner in poultry keeping than the colouration of newly-hatched pure-bred chickens, and it is not infrequent that the lack of this knowledge is the cause of much acrimonious correspondence between the purchasers and sellers of sittings of eggs. It is widely thought that the colour of a chicken's down should be an indication of the pigment as it should appear in an adult of the same variety; and that the bird's colour changes with the phases of growth is never supposed. The following general description of the appearance of newly-hatched chickens by Mr. F. J. Broomhead may therefore save many such disputes and also considerable anxiety to novices: "In the black varieties of all breeds, Orpingtons, Cochins, Wyandottes, Leghorns, Minorcas, Langshans, La Bresse, Hamburghs, etc., the newly-hatched chicken is black and white, or creamy, the former colour often being less conspicuous than the latter; indeed, a chicken of a black variety that comes out of its shell entirely black will almost invariably never be a brilliantly-coloured adult, and it is well known among breeders that the greater amount of white on the breast and round the head, the better will be the lustre of the final plumage. The white will be frequently found on the flights and secondary feathers, about the throat and head, and on the breast and under parts. In white varieties that have yellow legs, such as white Wyandottes and Plymouth Rocks, the chickens often present a creamy, or even canary, tinge, some white Rock chickens being of a grey or bluish colour but it will be found that such chickens as they mature come more free from sappiness (a pale primrose tint) than those that are pure white at birth. In barred fowls, like the Plymouth Rock, the downy chicken gives no sign of marking, being somewhat similar to the young of black poultry; it is what may be described as dark greyish-black and white or creamy white, the black being mostly on the back. As the down is cast, the barring generally comes first across the shoulders, then over the crop and down the breast. The buff Orpington day-old chicken will be of a buff or yellow tint, with a soft reddish-yellow ochre tinge in leg colour, the white shanks often not appearing until the bird is several weeks old. Occasionally, in some buff breeds, there may be ticks of black in the down, some buff Leghorn chickens having been known to show indications of stripes on their backs. In chickens of the black-red varieties, where brown predominates in the plumage of the hen, and black and red in that of the male, such as partridge Cochins and Wyandottes, brown Leghorns, black-red Game and Indian Game, the colouration is almost identical. It consists of a wide stripe of reddish-brown or maroon, running from the base of the beak, over the head, and down the back to the tail, with lighter and narrower, and sometimes black and light fawn, alternating stripes on either side, the general body colour being of a light brown shade or fawn. A fact that should not be overlooked by the novice poultry-keeper is that the young of all black fowls, and of those in whose plumage black largely enters, always show white in wings.

As regards the leg colour of chickens, it may be remarked that in yellow-shanked varieties, more especially in black Leghorns, if that colour appears at birth it may be reckoned with a large degree of certainty that the adult birds will have too pale-coloured legs; it is far better, provided that the under part of the foot is yellow, that the leg be willow or marked with that colour, or even show traces of green or black. In the case of willow-legged birds, on the contrary, it is usually considered a good sign if the chickens come with yellow shanks. As has been indicated, white-legged fowls are born with yellow-coloured legs. Some strains, however, appear to enter the world with white legs; but closer examination will show that there is a distinct light slate-blue tinge; it is one that never clears, and will always be retained. The legs of black Orpington chickens are what may be termed "patchy," and are far from solid black; they generally come black near the junction of the leg and body, and then take on a yellowish flesh-coloured cast, and change gradually with the plumage. The above illustrations could be augmented, but enough has been said to indicate that there is much dissimilarity between the colour of a newly-hatched chicken and the same bird in an adult state.

Roosting.

The larger breeds are better not allowed to perch till at least four months old, Cochins and Brahmas even till six. It is to be remembered that many generations of forcing diet and more or less confinement have produced a weight of body much greater than Nature would have attained, with a softness of texture also greater than hers. Hence the result of rash perching is often the deformity of a crooked breast. A fowl on unlimited range, sleeping out of doors or in trees, would take no harm from perching; but for most large stock it is not safe, and the better plan is soft bedding down, either on a dry floor, or a shelf arranged as a roost. Dry ashes are as good as anything for very young birds, or peat moss litter; later on plenty of straw keeps the plumage cleaner, but is unnecessary till the adult or exhibition plumage begins to grow. All through, however, care should be taken to give enough soft material for the claws to enter easily, as crooked toes may be caused by a hard flat surface as easily at this period as during fledgling days.

Care of Adult Plumage.

The first appearance of the permanent feathers, which do not replace the nestling feathers by a definite moult as in adult birds, but slowly and gradually as new leaves replace old on an evergreen tree, brings the breeder a new and different set of cares as he studies to avoid or prevent anything that may impair colour, or condition, or development when full grown. Shade now becomes more important than ever, almost all-important. Exposure to the sun turns white plumage yellow, while buff and other colours are faded or bleached, and even black loses its lustre for a shabby dull colour, sometimes distinctly brown. White lobes will suffer also from either free sunshine or strong winds, the latter causing roughness as well as tinges of red. A piece of coppice divided into runs is the best shade of all for this period, but few can command it. Some shade is always possible, but it needs to be remembered that while maturing for exhibition it must not only be provided, but the birds *kept* out of the summer sun except for a very limited time.

Colour of Shanks.

In many varieties a good yellow in the shanks is also of importance, and is best preserved by habitual running over fresh grass, especially if on ferruginous soil. Almost any shanks will be bleached by running on chalky soil or loose lime rubbish, which otherwise is conducive to dryness and health in a shed; hence such must be avoided for yellow-legged breeds. Some have advised making a run damp, or compelling the birds to walk through a water-pan in entering or leaving the houses; but treatment of this kind is dangerous to health in several obvious ways, and (although moisture has some undoubted effect in preserving a rich yellow) is not so successful as supposed. Shady grass is usually sufficient, but if it is thought that more is required, about all that can really be done will be secured by carefully sponging the shanks each night with a sponge nearly wrung out of tepid water containing a teaspoonful of glycerine to the pint; or slightly with petroleum oil, sponging off so as to leave as little as possible. If more be used, dirt collects underneath the scales, but by applying at night and sponging almost off this is avoided, and perceptible improvement effected in many instances, while the smell of the oil will greatly repel insects.

Colour leads us to another very important question, which has caused much controversy, as to how far it is possible, and how far permissible if possible, to alter the colour of fowls by the food given to them. It has long been known that food has considerable effect upon colour. Yellow or red maize will make most white fowls perceptibly more yellow than white maize or other grain, and much hempseed will darken the ground colour of a moulting Brahma hen. It has also been known for many years that the constant use of iron, whether in natural chalybeate streams or given artificially, tends generally to intensify colour, whether in legs, plumage, or yolks of the eggs. The most definite effect of food upon colour generally known is in canaries, in which (or rather in some of which, for the effect varies greatly in individuals) the constant administration of cayenne throughout the whole period during which the feather is growing converts a rich yellow into very deep *orange-red.* This fact, coupled with the success of some breeders in showing rich deep buff in the many buff varieties of fowls which have become so popular since 1890, has led many to the conclusion that the best specimens owe their fine buff colour, and other colours like the bay of Golden Hamburghs, their richness, to special *feeding* even more than to careful breeding, and "colour feed" for poultry is occasionally advertised in the poultry papers.

Colour Feeding.

The question has hitherto only practically concerned buff varieties of poultry, in which English taste about 1897 began to show a strong inclination—perhaps spasmodic—for very rich and deep colour, verging upon what was once termed cinnamon, instead of the beautiful rich orange-lemon once so carefully sought by all buff Cochin breeders, and which we still think the choicest colour for a buff fowl. But even in that limited field it is difficult to say what actual result can be accomplished in this way. Mr. E. Cobb, a well-known writer and County Council lecturer, has stated as of his own personal knowledge that "many" birds too light for successful exhibition, but otherwise good, have been converted into winners; adding, however, that out of a number subjected to the process only some will respond to it, as is also the case with canaries. We have seen three additional independent testimonies beside, from exhibitors who state the same as their own experience, after carrying out Mr. Cobb's advice. On the other hand, we ourselves suggested experimenting with cayenne feeding upon buff Cochins thirty years ago, and we knew this to have been done with no perceptible effect; and in a long controversy upon the subject during 1898, several large breeders of buff varieties, whose word there is no reason to doubt, stated that they had experimented extensively, and given it up as yielding no result. It is absolutely certain that no better buffs have been produced in general since "feeding" was practised than were bred before it was known; but, of course, this does not prove that their number has not been increased by specimens which would only have been inferior otherwise. Also in the early experiments above alluded to, cayenne alone was used, whereas it is now believed that iron and some amount of fat are also advisable. Our own opinion is that in a certain number of cases there may probably be appreciable gain, but that it has been greatly exaggerated; and certainly no breeder who will breed with sufficient care need be afraid of being beaten by mere colour feeding. Attentive scrutiny of buffs generally at exhibitions, since publication of the colour feeding process, has led us to surmise that the more usual effect when marked (for in many birds none at all is admittedly produced) may probably be to deepen the colour in localised patches rather than all over—in pullets usually at the sides of the breast and of the cushion near the tail, sometimes on the flat of the wing, the deepened colour being of a peculiar "bricky" tint by no means attractive. It appears probable, however, that in individual cases colour may be so gained without this patchy effect.

The ethics of the question cannot be discussed here beyond a few words. Earnest and even violent efforts were once made in England to induce the Poultry Club to pronounce colour feeding fraudulent. As the means for this kind of improvement, if any, have long been published and open to all, while, on the other hand, it is utterly impossible of proof by any known test that colour feeding has been employed, such a course would be obviously impracticable, and could only handicap the more virtuous breeders in favour of the dishonest ones, to the extent of whatever was gained by the process. Till some method of detection is known, nothing of the sort could have other than calamitous effect. But there is another insuperable difficulty as to drawing any line. Iron undoubtedly has some effect, many people think the principal effect. Yet we have, ever since first writing on poultry matters, constantly prescribed iron tonic, and that during the entire period of moult; and if iron tonic or yellow maize are not prohibited, how is a distinction to be made?

The difficulty becomes greater still when we consider the general law governing colour in

Laws of Animal Colouration.

animals; for there is such a law traceable. If we heat a coloured oxide, we are expanding it and also, as a scientific man calls it, "adding energy" to it; and even in this simple case, the usual result is to change its colour towards a tint nearer what a physicist terms "the red end of the spectrum," in order of the rainbow colours. Heating a globule of copper borate, which is blue, it turns green; if we heat the yellow oxide of mercury, it gradually turns orange, red, brown, and finally almost black. Now, very curiously, it seems as if a general rule can be traced by which animal colours also, starting from the highest degree of vitality or energy, as we diminish this tend to change in the converse order of black (the highest), brown, red, orange, green, blue, white; this law explaining most changes as an infant gains strength, and again declines in energy with old age, or from privation. Various monkeys, *e.g.* in infancy are greyish yellow, then reddish brown, and finally black. Children's hair generally changes from very light or yellow to red or brown or black; while with age comes grey and white. At the wreck of the *Strathmore* it was observed that not only did ordinary colours become grey and flaxen, but black hair became for a time red and brown. Thus it seems as if richer colour may be probably the effect of either more vitality or heat of blood. Eastern breeds lay brown eggs, and the early native Cochins were darker, more cinnamon, than the colour became in our colder clime. Canaries were green; our rooms and more stimulating food made them yellow; fed on still more stimulating food, we have seen that many become orange-red. Budgerigars are similarly changing from green to yellow. Cayenne was probably first given to canaries as a beneficial stimulant, just as iron in various forms was long ago prescribed by us for fowls; and it is possible that the main colour effect of these things may be a *tonic* effect. As to special ingredients and effects, we remember personally the time when the use of linseed for gloss, as described in our next chapter, was a jealously guarded secret, which we first made public: where is the difference between this, for one special end, and heating tonics for another?

Colour Feeding for Buff Fowls.

Colour feeding for enriching buffs, if carried on at all, must be so from the first beginning of the growth of the plumage to the very end of that growth, whether in chickens or moulting adults. The regimen usually recommended is half a teaspoonful of cayenne, of which the cool kind is just as good as the hot, given every day in the soft food, along with about two grains carbonate or three grains saccharated carbonate of iron. A little fat should be mixed also along with the cayenne. Merely for enriching bays and crimsons, as in a Partridge Cochin cockerel, there can be nothing gained by anything more than saccharated carbonate of iron; plain carbonate is cheaper, but saccharated is more readily assimilated by the animal system. On the other hand, there is some reason to think that iron may be occasionally injurious to a buff bird, in accentuating the slightest *difference* of colour. While a uniform colour would probably be slightly deepened in tone, any deeper patches, or the slightest tendency to black specks, would probably be brought into stronger relief by iron, while cayenne would be less likely to have this effect. One or two people have recommended the "yellow" cayenne or colour feed sold to canary breeders; and we have also seen Silk's and Sandiford's canary feeds recommended. We repeat, however, that if by careful breeding an even and rich buff has been produced, there is not the slightest reason to believe it will ever be surpassed by colour feeding: the sole question is as to how nearly inferior colour may be made to equal or approach it.

Remarkable Facts Concerning Colour in Birds.

As a field for experiment, colour feeding is a tempting one, on which account we should be sorry to see it barred, though we do not anticipate much direct result from it. The principal facts known up to the present may be worth summarising, and are full of interest. There is a family of African birds known as Turacos or Plantain-Eaters, containing twenty-five species, of which eighteen manifest the following extraordinary phenomena. On certain wing feathers, of dark violet ground colour, are patches and spots of bright crimson; also in some, on a few head feathers. This crimson soaks out into cold water, and birds kept in captivity wash out these patches to a dirty white in their bath, while the wild ones become a dirty grey or very pale pink in the rainy season! In dilute ammonia it dissolves easily. Analysis shows this colour to contain 7 per cent. of its weight, when precipitated from ammonia solution, of pure copper, probably deposited from *bananas*, in which copper is found, and on which the birds feed. So full of copper is it that a red piece of feather burnt gives a green flame. Copper is also found in a green pigment got from the same family; and Mr. Lupton has found copper in the feathers of some Australian green parrakeets. It is remarkable that these latter are found in the copper districts, and that in captivity the birds prefer, and constantly mouth and peck at, *brass* rails. Yet these strong metallic colours are strictly localised, no colour, or any copper, being found in adjacent parts of the very same feather. Also in some species of Turaco which have none of this colour, the same patches, instead of being crimson, are *white;* where for some reason *this* colour fails to deposit, there is no colour at all! From many other birds, various colours have been extracted by Mr. Church and others, by such solvents as alcohol, ether and alkaline solution.

The Brazilians have an extraordinary method of modifying the colour of certain parrots, which are naturally green about the head. When these feathers are just showing, they apply to them the secretion from the skin of a certain native toad, with the result that the feathers then become, not green, but bright yellow! This is no exhibition matter; simply a custom or fashion the people have. The result and the process are alike extraordinary, and still more, perhaps, how it can have been discovered in the first place. Here we perhaps have an example of colour-feeding individual feathers, for it certainly is not a dye in any ordinary sense, only affecting the growing plumage.

The most interesting results, as ascertained by direct scientific experiment, were communicated by Dr. Sauermann to the Vienna Ornithological Association.* He ascertained definitely in regard to cayenne, that the piperine or hot ingredient of hot peppers had no part in the result; that the coloured component given pure had also very little effect; and that it was only efficacious when given in chemical combination with albumen or fat. Feeding cayenne to twelve white Leghorns, two only of the birds showed results, these two beginning to do so after ten days. In their case the plumage was turned red, but chiefly in two places only, the breast and the hackles, the body much less so, and the flights and tail remaining white to the last. The colour only appeared on the surface, where exposed to the light. The second season or moult the same birds were cayenne-fed again, but now became a duller reddish brown in the coloured portions. The legs and feet were also coloured orange red. The yolks of the eggs also became red, in some cases bright blood red. Such yolks could not be boiled hard, the soluble fat being increased at the expense of the solids. All the fatty parts revealed the presence of colouring matter. On hatching the eggs, the chickens showed no colour in the down, but were decidedly red in the first feathers, which, however, soon faded unless they were themselves fed on cayenne. It was remarkable that while only two out of the twelve pullets originally fed were able to absorb the colour, all the chickens hatched from these two coloured birds inherited the tendency.

A series of experiments were then made upon canaries with aniline dyes, which it was found were rarely poisonous when pure. Given in water, a few birds only were slightly affected, and the effect lasted only during the growth of the feathers. By rather difficult processes the dyes were then combined chemically with oil, but little result was obtained in the way of colour, owing (as was afterwards found) to *excess* of the colour feed. But a most extraordinary result was established in the way of direct connection between *colour feed* and *moulting* itself, which may possibly prove of use in regard to the latter, and which Dr. Sauermann thought probably due to the soluble fats combined with the colour. The canaries fed with coloured oils did not moult. Whenever the feed was stopped, moult continued; when resumed, they "stuck" again. Similarly, by feeding cayenne in larger quantities to fowls, their moult also was postponed till the end of December. These facts probably explain why some insectivorous birds cannot moult in captivity. On the contrary side, one colour was found—gentian violet—which had the property of *inducing moult at any time*, even quite out of the ordinary course.

Finally a few of the dyes were combined with albumen, and in this form, and given *more sparingly*, striking results were obtained. At first the dyes were boiled with grain, with whose albumen they then combine; but it was found sufficient to mix them in ordinary bread before baking the latter. The dyes thus treated lose their bitter taste, and crumbs are eaten freely. Only two dyes are reported on in the paper. By feeding fawn-coloured Isabel pigeons with methyl-eosin (known to chemists as methyltetrabromofluorescein) the colour was changed to red, and was fast. By feeding Budgerigars with methyl-violet (chemically a combination of the hydrochlorides of pentamethylpararosaniline and hexamethylpararosaniline), they became *blue*. These blue Budgerigars are the most striking result yet produced in bird culture, and in their case the dye was combined with millet, or baked with egg-bread to be given to the young. Only 30 per cent. of the birds experimented with were affected, whilst of white fowls fed with cayenne only 20 per cent. responded. It will be remembered that amongst canaries the Norwich chiefly is affected by cayenne, and not all alike among even these. The patchy or local effect on the white fowls will also be noticed, and corresponds with what we found amongst buffs.

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* *Die Schwalbe*, April 30 and May 15, 1890. An English translation appeared some time after in the *Feathered World*.

Care of Leg Feather.

Leg feather requires care, else it will be worn off or broken. The grass in runs for feather-legged fowls should be mown short and frequently, so as to keep it not only short but soft and lawn-like in condition, and the shedding should contain nothing but absolutely fine and dry material. We do not think the plan adopted by some of allowing no dusting material at all, and depending upon insect powder or other treatment to avoid vermin, a good one. The vermin may be avoided, we admit, but it is not good for either feet or carriage to keep a heavy fowl on a hard floor, and here again we have a cause of the recent increase in crooked toes. We found a mixture of either fine dry sand or finely sifted coal ashes, with plenty of finely cut straw chaff, several inches deep in a large shed, keep both the plumage and leg feather of our Brahmas in admirable condition, and they never had anything else except their grass run or outer yard. Long dry straw, on the other hand, does wear away the feathering if allowed continuously.

Nearing Maturity.

The age at which chickens mature varies from less than six months to eight or nine, large Asiatic cockerels being the slowest to mature, and pullets and smaller breeds requiring less time. As it approaches, the taller birds may suffer from some leg weakness if they have grown fast, though the bone dust already spoken of is a great preventive. Should it occur in spite of this, its direct treatment must be sought amongst that of other ailments. When near maturity, meat or other stimulating food should be withdrawn from pullets which it is not desired should lay early, and laying may also be postponed somewhat by changing them every two or three weeks to a fresh run. The too free use of meat with pullets leads to premature laying and to permanently small eggs, through over-stimulation of the ovary and consequent injury to that organ. In experiments conducted by Mr. F. J. Broomhead, the editor of *Poultry*, he found that by meat feeding buff Orpingtons and Plymouth Rocks were induced to lay at 16 weeks old. Their eggs, however, were no larger than those of a pigeon, and no subsequent method of feeding, even when the birds were in their second laying season, and weighed 9 to 9½ lbs., had the slightest effect on the size of the egg. As exhibition birds, pullets hardly ever look so well as just before they lay. Cockerels are better rather older, as already hinted. As they attain the final stages every possible care should be taken to avoid any accidental injury. The holes into the houses should be of ample size, every door that is open be left *wide* open and fastened so, and care taken if they perch that neither tails nor bodies come against a wall. Every night they should be visited to see that all are right and none squatting in dirty corners. They should never be driven about or frightened, and, if anything has to be done, be taken from the perch at night.

Tameness and Docility.

All through let the chickens be kept tame. A grain or two of groats or hemp every time of passing will establish pleasant relations; so does waiting in the run whilst the food is eaten. Stillness and quietness of manner soon remove fear, and with an occasional titbit they soon lose all dislike of being handled, and may be taken up out of a run with perfect unconcern.

Slipped Wings.

There is one danger to which the larger Asiatic breeds are particularly liable during this maturing period, and which often disfigures an otherwise fine bird. We allude to what poultry men call "slipped" or "turned" wings; the primary feathers, or those which ought to be nicely tucked away out of sight when the wing is closed, protruding in more or less disorder outside the others. The tendency is to some extent hereditary, no doubt, and it mars the beauty of a bird completely. Pullets are far less liable to it than cockerels, and therefore when it occurs in the female sex it is proportionately more serious in character. In the most aggravated form the flight feathers appear actually twisted, so that the proper inside of the feathers becomes outside, and in this form the affection is both *strongly* hereditary and, we believe, incurable. But when it merely amounts to failing to tuck the flight feathers in, without any great disorder among those feathers themselves, it may generally be cured if taken in due time. The usual cause we believe to be the buffeting of cockerels by their stronger neighbours, which causes rapid flapping, followed by imperfect closing, and after a few times this becomes habitual and the mischief is done; at least, it more rarely occurs in a wide run, or in the master-bird of the yard.

The treatment is simple. As soon as any displacement of the new feathers is observed the wings should be carefully tucked up every night at roost; but nothing further can be done till they are grown enough to hold a ligature, when one or both wings, as required, should be carefully bound up with each feather in proper position. The manner in which this is done is shown in Fig. 80, the wing being bound round rather tightly near the middle, after which the cord is carried from the knot at A, round the shoulder at B, to the inside part of the ligature at C; this is, of course, simply to prevent the ligature from slipping off, which the bird will use all his endeavours to effect. Soft string about the thickness of stout whip-cord should be employed, and the operation be performed at night for the sake of quietness. A little judgment in tying is necessary, as if the retaining cord A B C be too slack the bird slips the bandage off, while if too tight it may cut and become embedded in the web at the shoulder, causing irritation and distress. Patience and tact are also required, and we have had birds we were obliged to tie up afresh for five or six nights before the feathers were retained in place to our satisfaction. The greatest care is to be taken that *every* feather is in position, on which all depends, and the bird is then to be left with his wing or wings tied till it is supposed the feathers are properly set. The ligature may then be cut, when if the result is satisfactory all is of course over; if not, the wings are to be again confined. There are few but may be thus cured if taken in due time. The ligature has a tendency to cut the feathers, but this may be avoided by folding a piece of stiff paper under the wing at D, and tying the ligature over that, which will preserve the wing from injury. There is some slight danger of Asiatic cocks acquiring the same fault during the moult. If the wings are seen properly tucked up every night at roost nothing further will commonly be needed; but if the blemish should appear to be becoming habitual, it must be treated in the manner just described.

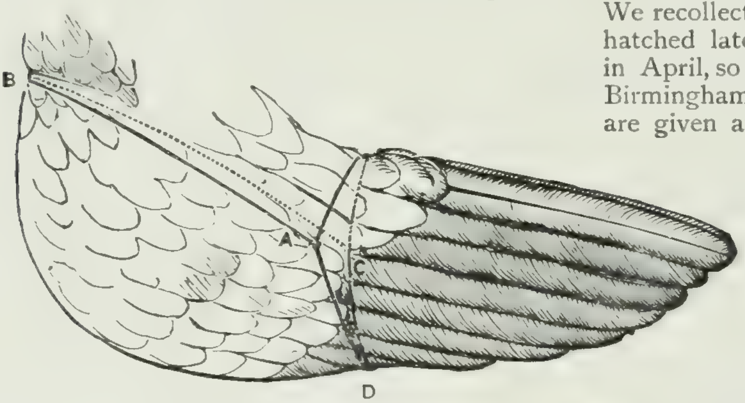

Fig. 80.—Tying a Wing.

Night Feeding for Older Chickens.

As winter approaches it is often of great benefit to return to special *night feeding;* but on this point judgment must be used. If the chickens have made their growth, and are of good weight and substance, and fairly set, there is no reason for it, and it may even do harm by making them too fat. But if cockerels, especially of the large breeds, are still immature and lanky, though promising, very much may be gained, when the days are short, in putting on body and weight by getting in an extra feed. We recollect once getting some Brahma pullets hatched late in May up to another lot hatched in April, so that one of each went as a pair to Birmingham. Suppose the three ordinary meals are given at 8 a.m., noon, and 4 p.m. Then if the chickens are lanky, much is gained by another feed at 10 p.m.; and, even if an extra full feed is not thought needful, much may be gained in appetite and profitable assimilation of the food, by giving the breakfast as before, a mere sprinkle at noon, another feed at 3 p.m., and the final feed at 9 or 10 p.m. In immature birds such night feeding does indubitably make size. Our own plan at last was to pour boiling water upon heavy oats in a bucket about 6 or 7 p.m., cover with a cloth, and give the warm steeped grain at ten o'clock, when it was eagerly looked for. We had tried other things, but the steeped oats pushed them on better than anything else, were eaten with avidity, and did not swell in the crops. The birds themselves were at that time bedded on straw, and when the lantern was put down it was curious to see them march forward, and when they were satisfied get back to bed again as quietly as a lot of children.

With such care and attention, if the stock and mating have been fairly good, there ought to be in due time some really good birds available for the show pen. Of course they may not win; for they are not the only chickens in the country, and however good they may be, someone else may have still better. But there should be some that will not disgrace the yard; and we will hope for the best, and proceed to consider their actual exhibition.

CHAPTER XIII.

EXHIBITING.

AS the actual time for exhibition approaches, it is well that attention and preparation be focussed upon it, especially if for an important show. In many cases special treatment for condition is useful; but it cannot be said too plainly that it all amounts to nothing in comparison with that *general* care in rearing and treatment already described, that many birds require no more, and that such as do not are those which show best. First-rate show condition means simply perfect health, cleanliness, that amount of flesh which looks best, and uninjured plumage, in a fowl tame enough to show well in its pen. There is no mystery in any of these; and though lack in one or another may be to some extent remedied by special measures, the fowl which needs none, as thousands do not, is the best fowl still, for showing as for anything else.

Summer Shows.

It will be convenient to consider the younger stock first. Here the time of hatching a bird will have been considered in reference to the exhibitions at which it is desired to appear. Some exhibitors lay themselves out specially for summer chicken shows, which entails hatching at New Year, or as soon after as possible. Some, we fear, anticipate January 1st by two or three months, but we do not envy such breeders their success over more honourable competitors. It is sufficient for us that the recognised rule of the Poultry Club, and of every fancier who puts honour above mere gain, is that chickens of the year should not be hatched before the New Year opens. Taking that as our starting point, it will be found that there is much extra trouble in rearing such early chickens, and the breeding stock and constitution of the strain are exhausted, as already pointed out; but, on the other hand. competition at these early shows is very small, and winning is now so difficult in the heavy competition of autumn and winter, that it is found by some worth while to pay the price for the sake of the easier victory. The chief care of those who engage in this class of showing is ample shade for their young stock, as the plumage will be maturing during the heat of the summer, and the sun tells more than upon the later birds. Ample green food is unequalled for giving condition to these forward chickens, and if some lettuces can be grown and fed regularly to them, they will be eaten with appetite even upon a grass run, and have marked effect in giving smoothness to the plumage. Such chickens should only be penned up a few days before exhibition, and if they can be kept clean enough to be shown without washing, they look much the better. These early birds mature soon, because they finish their growth during warm weather, being often in full feather at from five to seven months old in the lighter breeds; but, unless in an exceptional season, the more slowly maturing fowls will rarely be fully furnished before October.

Preparing for a Given Date.

Chickens hatched later require more time, especially the large Asiatics; and for the chief exhibitions much can be done to "nurse" them, or have them just ready for the time required. The furnishing of the cockerels may be rather postponed by the use of dry bone dust, or hastened (if the combs will admit of it) by fresh bone or meat, and some sulphur twice or three times a week; also if a fine but raw-looking cockerel be put with a couple of hens for a few weeks before a show, it will often set him up and "make" him up faster. Such a bird cannot, however, be put back with the others again, and this expedient should only be employed when needed, and when proper arrangements can be made for him afterwards. Time is still more important in the case of pullets, which are at their very best just before laying. That time would naturally vary with the breed and the feeding; and, if it does not come right, effort should be made to postpone laying by changing the best pullets from one pen to another every ten days, and leaving off all stimulating food; in this way laying may often be kept at bay for a month or two.

We advise that, if space permits, before the season for exhibition or sales (and sales from the yard itself involve a kind of exhibition to the purchaser) the chickens be sorted out, not only as cockerels and pullets, but into lots according to their value, as well as age. It is distinctly prejudicial to sales to show a purchaser birds far superior to what he is able or willing to pay for—it makes these latter appear distinctly worse by comparison; and for this reason some breeders keep their very best away, where they are never seen by visitors at all. On the other hand, a successful breeder requires to keep even his own eye in training, and critical to demand a certain high standard of perfection; this is far better done if his very choicest are kept in one run together. Such a plan, moreover, keeps the best birds more constantly under the eye, and makes any weak point apparent early, when perhaps something may be done to remedy it.

Backward Plumage.

Thus, in regard to the final furnishing or feathering out, it may happen that the tail and other feathers seem to hang in development. This should always receive attention, but its proper treatment will depend upon circumstances. If iron tonics and meat have not hitherto been given, these and a little sulphur every other day will often put matters right. But if they have been part of the regimen already, it is no use giving more; possibly they may have already been overdone. More benefit is likely in such a case to follow a daily dose of 6 to 10 grains citrate of potash, which is not lowering, but often has a wonderful effect, purifying and invigorating the blood. Above all, however, the bird should be most sedulously examined for insect vermin, which is a most frequent cause of these apparent stoppages, especially where dust baths are denied to the birds for fear of injuring the plumage, and insecticides relied upon instead. A fowl infested with vermin cannot be matured into good condition.

Comb Falling Over.

Among the many large-combed breeds now so popular, an apparently good comb may appear to be falling over, and if treated at once, may often be saved, at all events for one particular show. This danger has much increased since the prejudicial craze for exaggerated combs has been in vogue, and really bad cases are not curable, especially when they have ensued upon warm housing and free meat feeding. Even when a bird is reared upon a moderate regimen and in a cool house, however, the mere strain of feathering out will sometimes cause a flabbiness or lassitude of comb that denotes evident danger. Here tonic, or if iron tonic has already been given, change of it to a tonic pill of 1 grain sulphate of iron and ½ grain of quinine, or better perhaps 1 grain citrate of iron and 10 grains citrate of potash, will be of assistance; and the comb should be placed in a support or cage. Such supports are advertised of slightly different patterns, which may be suitable for different heads and combs; but all are founded upon that formerly used by the celebrated Spanish breeders of Bristol, devised by the late Mr. Sydenham Roué, which is equal to any of them, and is shown in Fig. 81.

The wire should be of aluminium or tinned iron, not copper, and is bent in one piece from the centre at A. The portion from A to B is carefully fitted to the skull at the base of the comb, so that B exactly reaches the nostrils, and the curve from B to C should about follow the base of the serrations, the ends at C being a little opened to avoid chafing. The wire should be first covered with thin red worsted to prevent sores. To put it on, the thin horn or cartilage between the two nostrils is pierced with a needle, which does not appear to give any pain at all; then A being drawn forward as far as it will go under the back of the comb, a bit of silk thread (or carbolised ligature would be better) is passed through the nostrils and corners B, and tied in a knot, tightly enough but not too much so, over the nostrils. If necessary, the wires at some point in the curve between B and C can also be tied together, by a thread through near the bottom of the notch between two spikes. Some tie to the wires between B and C, inside and next the comb, curved slips of card. As a rule, a bird thus decorated must be kept from hens, who have a propensity to peck at any knot and so destroy the arrangement. The legitimate usefulness of such a support as this is great, since cockerels often return from a heated show with a comb relaxed and drooping, or it may fall over during moult, or the frame may tide a cockerel over the temporary critical period of lassitude here in question. There are, however, birds which rarely have it off *except* during exhibition, whose combs "will stand about a week" and no more; and it was the deliberate

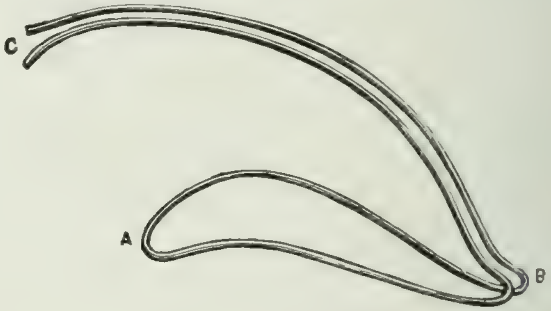

Fig. 81.—Comb Support.

opinion of the old Bristol fanciers who first used comb cages, and tested them in all degrees most thoroughly, that their constant use to assist really flabby combs, as is so widely the case to-day, rather than breed good ones, brings sure retribution in a weak-combed strain of birds.

Combs of Pullets.

On the other hand, the comb of an otherwise promising pullet may seem backward, and need encouraging, especially if she has been brought up hardy, in a cool house. Here a few weeks in a sheltered and slightly warm pen, with rather more animal food, will bring her up to the mark if the parents have been so; but birds so treated should always be gradually habituated to a cool temperature again, before winter comes on. Some have advocated working and extending a pullet's comb between the fingers, as is practised upon the ears of lop-eared rabbits; and we have seen a comb enlarged considerably in this way. Nevertheless, such dodges are not worth while. No lop fancier would dream of treating thus any rabbit with really small ears; and as it is, the result in his case is hard callosity and loss of circulation in the part so treated. So in pullets, really decent combs are plentiful, and need nothing of the sort; and combs thus abused, owing to the effect upon the blood circulation, are terribly subject to frost-bite. As comb is not a really difficult point in pullets, and decently bred birds need nothing at all beyond possibly a little temporary extra warmth and feeding, it is a great pity to spread the impression that such dodges are largely practised by extra "knowing" ones; in reality they are almost confined to novices who have learnt them from others about equally well-informed.

Ear Lobes.

Ear lobes which appear somewhat deficient in growth are more susceptible of extension without injury, the part being softer and more elastic, with less of natural vitality. Much depends, however, upon the manner of it, as was discovered by those old Bristol Spanish breeders already mentioned, who brought white ear lobes to a perfection that has never been equalled since their day, much less surpassed. They had tried, and abandoned, working about the lobes between thumb and finger, as advised by some. This will enlarge a lobe; but they discarded it because—so they said—it tended to enlarge the surface more than the structure, and so increased folds on that surface, which they desired smooth and even. Their plan was rather, not only when cleansing a lobe, but at roost and as opportunity offered, to very gently *stretch* a lobe by pulling at the edges. It was essential to be gentle, never stretching tightly, which also caused wrinkles or folds; but the lobe was so held at very gentle tension for a little while, giving the principal stretch in the direction where more size was specially wanted. Such was the method, they found, by which most could be done, being useful in promoting even surface as well as greater size. It is best to let well alone, if nothing is needed in this way; but if a *little* more is really wanted, or a fold threatens, matters can often be improved by a little care and manipulation in good time.

There is also colour of the lobes to be looked after, and if red threatens upon such as should be white, it is time to give the birds shelter, especially from the wind, or in particular cases a rather darkened run and slightly warm temperature. A strong wind will often roughen and redden a fine smooth lobe in three days; but it can generally be recovered by these means. Where smooth whiteness is a great point, lobes which have matured satisfactorily should be carefully cleaned every day, using the first time mild soap and tepid water, with a very soft bit of Turkey sponge; afterwards tepid milk and water. The lobes should be gently but thoroughly dried afterwards with a soft woolly towel, and when quite dry dusted with violet powder, or if there are any signs of soreness, with oxide of zinc.

A red lobe, on the other hand, may develop evident tendency to an undesirable white or pale centre. Here exposure to air and wind is the natural remedy, which may often be assisted by the citrate of iron and potash tonic above mentioned, and by brisk friction of the weak spot as often as convenient with a piece of rough towel. The rubbing is not to be hard, but of a quick character, calculated to cause a hot glow under it, and so cause more flow of blood to the part. Some allege benefit from application of stimulants, such as capsicum vaseline, and it is not improbable, these applications also bringing the blood to the capillaries at the surface, which is the effect desired.

Wry Tail.

A promising cockerel may sometimes develop all of a sudden a tendency to wry tail, or squirrel tail. Where this has appeared gradually from an early age, the cause is curvature of the spine, and such birds should be executed. But in other instances it seems a habit, or due to some sudden strain, as from a bird backing up against a wall, or from some slight inequality of a muscle or tendon, due originally perhaps to such a cause. Such cases are not hereditary as the first class are, and as they are often removable by a simple operation, many think it as permissible to do this as to operate for a squint in the human subject. It is perhaps rather debatable ground, which we must leave to each to decide for himself; but we certainly think such cases differ radically from attempts to imitate fancy points, which present real difficulty in breeding them to the required standard. Nothing should be done till the tail is grown, as sometimes it will appear awry when only partly grown, but be all right when fully out. Then if it still persists, in slight cases it is often enough to make a small scar or eschar at *a* or *b* (Fig. 82) on the side of the neck of the tail joint, commonly called the "parson's nose." A scar is made by snipping out a bit of the skin half an inch long by almost a quarter of an inch wide, the longer diameter being downwards; an eschar by well rubbing wetted lunar caustic over a space the same size, and it should be done on the side opposite that towards which the tail is carried. The scar or eschar will tend to slightly contract, and as if stretched it will feel a little sore, to avoid this the bird will ease his tail more to the desired side, and often the end will be attained. If this is not effectual, when the tail is strongly bent away from its undesired position, very often a tight cord or tendon will be felt, rising as it were against the finger, and if this be cut (the same applying to the top of the joint in some sudden cases of acquired squirrel tail; chronic cases are not fit subjects for treatment) a cure probably follows. The cut should not be made from the surface, but a very narrow sharp knife (called by surgeons a bistoury) dipped in diluted carbolic acid should be inserted *under* the cord, and the cut made with a sawing motion from beneath, but without cutting through the skin above. After either operation the tail should be worked a little daily, till it sets in the proper position.

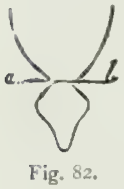

Fig. 82.

Selecting Specimens for Exhibition.

At last the birds for exhibition at a given date have to be finally selected. The usual error is to send too many, which an experienced exhibitor never does unless he wants them on the spot for the probability of selling them, or to show what a team he has, or because, knowing he is stronger than usual, he wants for some reason to make a grand *coup*, as was the case amongst the Dark Brahma chickens at the Crystal Palace Show of 1899. Here one exhibitor carried off the challenge cup, third, fourth, fifth, sixth, seventh, and eighth prizes in the cockerels; and another the cup, second, third, fourth, sixth, seventh, eighth, and ninth in the pullets. But such cases are rare, and the beginner had better make up his mind that only his very best have a real chance of winning, and that more will be waste of money in entry fees. He may have more, really good and worth money; but a good show collects the *best*, and his own best will make the best record for him. These he should carefully select and compare *in pens*, with a set of which, greater or less in number, every sensible exhibitor provides his establishment, being highly necessary for the training of the birds as well as the selection of them. We think it much better to have larger pens than are used for exhibition, as the specimens are equally well seen, and stand the confinement better; for our own Brahmas we adopted three feet square. In such wired pens all the possible candidates are closely scrutinised, and it will often be found that those which look best as they run do not appear so when in the pen, for some reason or other.*

Pen Training.

But all are better for some training in a pen before showing, and the same proceeding has further uses in promoting cleanliness and condition. A fowl just picked up off a run, and penned up at a show for the first time, is wild and frightened, and will never catch a judge's eye; want of symmetry alone would throw it out. A week before the show will be sufficient, and before being placed in the pen the bird should have its legs and feet washed clean, using soap and a nail brush if necessary; and also the head, for which a softer tooth brush is more convenient. The pen should be first sprinkled with good grit, over which is thrown straw chaff; this chaff will keep them clean, and is most important, the grit for digestion being equally so. As often as possible the birds should be visited, and if unusually wild, first a little starved, in order that they may welcome the feeder with food. But as much as possible of passing and repassing, standing in front of them, stroking them down the back with the end of a stick, and occasional throwing of a grain or two of hempseed, will soon quiet them, till they will let themselves be turned about with a cane into all different positions without making a fuss, and stand composedly to be looked at, and come to the front of the pen. The object is then attained, and the birds are "trained." Those which have been petted and kept tame all through, however, make the best show of themselves, and manifest a calm *aplomb* which is seldom quite reached by those pen-trained alone.

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* We recollect upon one occasion possessing two cockerels clearly ahead of the others, one of which we had almost determined upon for the Crystal Palace Show. We had, however, both placed in pens, being too ill to do more at the moment than wipe their heads and feet. We were confined to bed for the next few days, but they were carefully fed, and on the day before sending off, we were able to get down to look at them, wrapped up in shawls. We instantly reversed our former conclusion, selecting the other bird, which won the cup of the year, as we feel sure our first choice would not have done, though in other hands he won at Edinburgh afterwards.

Gloss of Plumage.

Some little modification in diet and regimen is often advisable, not only during this training time, but even perhaps for two or three weeks before the show. There is no mystery about this, nor is it a case for a table of directions; all is simple enough, and to be governed by reasonable judgment. Many birds, even chickens, look better for a little more flesh than they usually have while running at large; that will be a case for liberal though careful feeding. Gloss will in most cases be increased, as well as flesh rather promoted, if every other day for two or three weeks the mash is mixed with thick linseed tea, well stewed, and with sufficient water to make a thinnish jelly; using this instead of water, seeds and all. A velvety lustre is often added by this means, and no measure of quantity is necessary, taking enough of the hot linseed tea and seeds to mix the meals into proper consistency. Active and sprightly birds, from a good-sized run, but not required "hard" like Game fowls, benefit most from this regimen, while full-fleshed ones previously kept in confinement might be deteriorated in health and condition; one must use judgment. When it can be borne, sometimes a little fat or linseed cake carefully added to the daily food improves lustre; and on the other hand, birds which have been kept in confined runs are occasionally improved in gloss by giving, for about ten days, two grains daily of saccharated carbonate of iron and about half a dozen cloves.

Colour of Combs.

If the colour of comb and face be somewhat pale, a little underdone meat, and one of the before mentioned (p. 212) citrate of iron and potash pills daily, or 10 grains of the iron citrate and 1 drachm of the potash citrate in half a pint of drinking water, will improve matters, as will sometimes a little toast soaked in old ale, or a teaspoonful daily of port wine. Mr. Cobb recommends 10 drops daily of colchicum wine in such cases for a week to ten days, and we have known marked improvement in colour from its use; but colchicum is a rather risky drug, whose after effects are sometimes bad, in depressing the action of the heart. Citrate of potash and iron is safer, we think quite as generally effectual, and can only be of benefit in any case, purifying and enriching the blood. Chopped onions and dandelion leaves daily in lieu of other green food are also of service in reddening combs. Birds with *dark* combs, from confinement and bad feeding, are not fit for exhibition at all until they have been brought into a better state of health.

What is needed in the way of cleaning will depend upon the colour. Dark or rich plumage will require nothing beyond the washing of heads and legs, and the confinement in the training pen, which is better rather out of the full light. Kept clean upon chaff, as here recommended, the plumage will become clean and bright and glossy, if the birds are healthy. We never needed any more than this with our Dark Brahmas. The ground colour may be light enough or bright enough to require rather more, as in some shades of Partridge Cochin pullets, or laced Wyandottes; in this case the best procedure, where there is accommodation, is to put the birds into a room deeply littered with straw, amongst which some wheat is scattered; a week or two of this will clean them up a great deal, and still preserve the natural oil, the loss of which is the great objection to washing rich coloured birds. Even buffs may often be sufficiently cleaned in this way, especially when from country runs; nay, we sometimes see pure whites, reared far from city smoke, which are all that can be desired, though evidently unwashed. The owner must judge about this; but as a rule white fowls, and other light colours like buff, do require washing all over.

Washing Fowls.

Before washing birds of his own, a novice will do well, if possible, to get a *practical* lesson, otherwise he will be slow to grasp the very thorough character of the process. This thoroughness is the secret of success, and most people fail in their early efforts because too nervous or squeamish about damaging the feathers. It is little or no use just to sponge down the outside plumage. At least one large oval tub, not much short of a foot deep for large fowls, must be provided, and unless there be facility for rapidly emptying and renewing the water twice, it is better to have three at once. Anyhow, plenty of hot water must be at command. Also provide a basinful of soap solution, such as washerwomen use, made by cutting up some *good* soap into thin slices and dissolving in hot water into almost a thin melted jelly. There is also wanted a good compact sponge, rather soft and just as large as the hand can squeeze easily, and some soft dry towels. In commencing operations the feet and legs should be washed first, and separately. Then the tub is filled about two-thirds with water about the heat of an ordinary hot bath, and the bird stood in this; it should be at least deep enough to come well up about the body, and if when the fowl is pushed down it covers the back, all the better. The first thing of all is to be sure that the bird is thoroughly drenched to the skin ; just dipping in does not do this. The plumage must be parted and worked about with the bare hand under the water, or the sponge, till every feather is soaked to the root. Then we begin with the soap, taking some up with the sponge, and thoroughly rubbing it into the fowl, one place at a time. It is to be a thorough good rubbing, all sorts of ways, except that we would not go straight against the lie of the feather, though we doubt if even that would do much damage. But down, and across to and fro, and energetically too, with the idea always of getting down to the skin ; keeping on at one part till more dirt ceases to come off. There is really no danger at this stage, and no difficulty provided the operator is not afraid to do his work, and sticks to the one point that *he has got to get his bird clean.* About the breast it is necessary to rub almost up and down, which is best done with the bare hand ; indeed, we have seen a bird well washed with hands alone, not using a sponge at all. The fluff also requires the hand, well worked about. Some use a brush to scrub, but this is not free from risk ; not to the feather as a whole, but to the proper webbing afterwards ; several times we have seen birds scrubbed with a brush, which did not seem to web smoothly when dry, and believe that the bristles brush out or off some of the tiny microscopic barbules which hold the web together. One very good washer we knew used chiefly a sponge wrapped in flannel, especially for the secondaries of the wings, and the tails : the slight roughness, he said, brought the dirt off well. It is best to wash the head last, in our opinion, for the simple reason that most fowls stand quietly till the head is done. This may be done with a nail brush if preferred, in that case only working it down the hackle of the head, but the late Mr. Elijah Smith, one of the best exhibitors of White Cochins, used to take the head between the palms of both hands, with soap, and wash it like a ball, using nothing else.

Here ends the first stage, on which most of all depends ; for if the bird is not clean now, it cannot be so later on. It may be worth remarking that if a fowl has to be left for a minute to get anything, and there be no assistant, the wet sponge laid across its back, between the wings, will generally keep it quite quiet, believing it is being held. Sometimes a heavy patient will appear faint in the hot water, or even go dark in comb as if about to die ; in that case a good douche of *cold* water should at once be given, which will bring it round, and it is curious that it never, or hardly ever, faints a second time. The soap is now as far as possible sponged out in the bath (which is, however, itself very soapy by this time), and the fluid also pressed out by hand, after which the bird is placed in another bath of clean warm water, and most thoroughly rinsed. This is the second important point—to be sure the soap is all really rinsed out, in default of which the plumage clogs, and does not web nicely. This water will of course do for washing the next bird. Pressing out the slightly soapy water also with the hands, the bird is finally to be transferred to a third tub, and again rinsed, rather quickly but thoroughly, in *cold* water, which closes the pores and prevents it taking cold. In the case of white fowls, it is advisable to put a very little blue in this final water ; not of course enough to look the least blue when finished, but just a trace, which adds considerably to the brilliance of a white bird.

Drying Fowls after Washing.

The washed and rinsed bird is now to be taken out upon a table or board, and the water got as far as possible out of it with the sponge squeezed dry. Many prefer to dry still further with dry towels ; personally we prefer only to dry the head, wipe down the neck, and just sop up the rest. Anything at this stage should be done the way of the feather. The bird is now to be transferred to a drying cage or box before a good but not fierce fire. A large box open on one side to the fire, and open or with a lid on the top, is best, or an exhibition hamper just large enough, unlined, may be stood in such a box. Considerable care is required at this stage, as the bird must be turned round from time to time, the wettest part to the fire, and not exposed to a strong heat, which is apt to blister the face, and will almost certainly warp and twist the hackle and other feathers. If room is scanty in front of the fire, its glare should be shielded from the birds by a screen of coarse linen ; what is wanted is a strong glow of dry warmth, not a fierce heat, and for the bird, in its basket or without, to be turned about with the wettest parts to the warmest side, so long as any evident wet remains. This may mean hours of labour with a team of birds washed in due succession ; one or two, of course, are done with sooner. Be it few or many, however, this final care is the third of the secrets in good washing ; and when the birds are nearly dry but still perceptibly damp, they should be placed in lined exhibition baskets, in a warm but not hot place, to finally dry out. The object of this is to have the final drying in a slightly moist or steamy atmosphere, somewhat confined by the lining; in such atmosphere experience shows that the plumage webs again best of all.

Rain or soft water should always be used for washing poultry, and really good mild soap, not a coarse alkaline quality. White fowls of loose plumage like Cochins may be shown next day if necessary, and we know that Mr. Elijah Smith on one occasion washed his birds in the morning, took them a few miles to the first railway junction (where he had in those early days several hours to wait), and dried them on the floor before the waiting-room fire! But the birds should, if possible, have at least a day to preen themselves and get the plumage in order in their own way; also, if anything is not properly done there is time to put it right. We would prefer two or three days, and they will keep perfectly clean if the pen has plenty of chaff as above advised, and the droppings are frequently removed. Another reason for a little time to spare, is that often slight laxity of the bowels may follow for a day or two. The reason for this, we believe, is either soap being swallowed or a slight chill; usually the latter, which might probably be prevented by five or six drops of essence of camphor on a bolus of meal first thing next morning, and taking care that they are not put direct from the warm drying basket into a cold pen. They should always be watched, and fed carefully the following day, food in the least sloppy being especially avoided.

Adult Fowls for Exhibition.

Management of adult fowls for exhibition resolves itself mainly into care of the plumage for the summer shows, good moulting for the winter ones, and the attainment of a proper amount of flesh. While chickens can be fed freely at all times, older fowls so treated would be fat and useless for stock; to be useful they are best kept considerably more spare than the most effective show condition. Hence actual breeding stock often requires perceptible feeding up before it can be considered in show trim. It is better by far to treat them thus, than to keep them in such condition for long periods, especially if of the larger breeds; and this is one of the reasons why old fowls of such breeds do not stand continuous showing. Here again, however, constant and ample green food is the greatest help and preservative. Most of the extra feeding should be given whilst still on the runs, and adult fowls which have had any experience will require less time in the training pen, a very few days being usually sufficient. What has been said already regarding gloss of feather, and colour of combs and lobes, will apply to them also.

Great care of their plumage is needed for summer competition. The hens may require seclusion from the cock during most of the day, and when serious breeding is over, are better taken away altogether. The male bird should, however, have a couple or more common hens left with him till about the end of June, during morning and evening; deprived altogether, he often becomes listless and dispirited. Both sexes should be shielded from hot sun, which bleaches or tans the plumage, and makes it brittle. If hens become broody, their management as to being allowed to sit a little, or turned off the nest at once, will have to be considered in connection with the date when they may be wanted, and how far the season is advanced, as any time after the early part of July it may possibly bring on a moult.

Moulting Exhibition Stock.

A fairly quick and good moult is the chief thing to aim at in regard to the later shows, and the fact just mentioned is of value in regard to hens. These should always be allowed a fair measure of rest in the summer, for if they are not, the mere want of strength thus caused may prevent their moulting quickly and well; but should any become broody after the first week in July, to allow them to sit for a month and then turn them off will often result in the casting of the feathers almost together, and the rapid growth of the new coat whilst the weather is still warm. This is the sort of moult a breeder likes. Much depends upon the date of hatching, and the experienced breeder lays his plans greatly in reference to this. Chickens hatched late in March and through April, and well cared for, may be expected to moult well and fairly early all their lives; but late hatched birds are apt to be late in moult, and on the other hand pullets hatched very early, too often lay very early and moult in their very first season, but late in the autumn. When this happens, the time of the bird's future moults is frequently upset for life, but not always.

Valued specimens, then, should be prepared beforehand for a good moult, by giving the hens rest when occasion offers, and separating the male birds for a reasonable time; but not overdoing this last, as already remarked. Their condition should also be carefully examined, with a view to feeding up, as already hinted in Chapter III. They need extra food and support through this period, but if already on the fleshy side, this might be disastrous; therefore take special care that they are in full vigour, but not in the least fleshy, and ready for the system of feeding there described. If they seem to require it, the tonic powder No. 3, page 199, may often be given with benefit, and if they are to be exhibited soon after, the stewed linseed for giving gloss should not be forgotten. Gloss is best promoted in moulting birds by keeping them in pens not exposed to full light, and giving linseed judiciously with carbonate of iron (unless given in the above tonic, which will suffice) to all except white or buff fowls, and sulphur as already mentioned. The effect of partial shade upon gloss is not understood, but is very real; and extreme green gloss, as desired in Langshans, Black Hamburghs, and other breeds, cannot be attained without it.

Vermin and Moult.

In spite of all, valuable birds may "hang" in the moult, or have difficulty in growing the new plumage. A very usual cause of this is insect vermin, which wide experience shows to take a larger and larger place as the real cause of many poultry ailments. Pains should therefore be taken to ensure that the birds are entirely free before moulting and during the process. The skin is naturally in an irritable and feverish condition, and anything of this sort is more felt than at any other time, while the young feathers are particularly liable to be attacked, and thus prevented from growing out properly. This cause of bad moulting was little known at one time, when a dry dust bath was freely allowed to exhibition poultry; but too often this is now discarded—more's the pity—for insect powder, petroleum washes, and other devices, and unless these are sedulously kept up, the birds suffer. Indeed, we have strong doubts whether they do not suffer even then, the *friction* of the dust bath being doubtless needed to cleanse the scurf-skin, as well as to destroy the parasites. Be this as it may, we do know that insect vermin as a cause of bad moulting has greatly increased since the new order of things.

Where moult seems to delay unaccountably, or to stand still after just a beginning, a change of temperature is generally a remedy. If the bird has been in a warm house, and it is not too cold, it may be placed in a cool one for a week or two; or, more commonly, it may be taken up and confined in a warm house. If with this change of abode there be coupled some sunflower-seed—about half the last feed of grain daily—the process will often be started satisfactorily. Hemp-seed has been used for the same purpose, but sunflower-seed is much better and more strengthening.

Moulting of the Shanks.

The shanks also may need attention at moulting time. Most fowls moult the scales on the shanks as well as the feathers on their bodies, and all are probably intended to do so. There seem to be exceptions, however, and in cases where the appearance or colour suffers from the persistence of old, dry, and horny scales, it is well to assist nature, which can usually be done. If such an old scale be nipped between the thumb-nails, it can usually be removed, and when the required action has been thus understood, the breeder will find no difficulty in selecting at any surgical cutler's a pair of tweezers or small forceps which will do the work better and more quickly. Birds are often seen in a pen in their old scales, which might easily have been removed in this way, to their great benefit in appearance. We also believe that leaving on these old and somewhat loosened scales is a great predisposing cause to the lodgment beneath of the little mite which causes scaly leg.

In regard to training and washing, nothing need be added to what was said above. Experienced old birds often need hardly any training or penning at all, so far as their manners are concerned; they have gone through the mill already, and know all about it; but penning is in most cases useful for cleaning purposes also, as before indicated. Special care should however be taken in feeding them up to the proper degree, any extra feed being given steadily and uniformly up to the desired point, not all piled on during a week or two. Though given more, appetite must still be carefully preserved. Large Asiatics need peculiar care to guard against over-fattening for exhibition, as they are wanted to look large and massive, whilst any approach to lazy torpidity must be eschewed. Here malt dust and ample green food are valuable aids, and an occasional 10 grains of citrate of potash will often clear the blood and pick a bird up if he seems to be getting dull and lazy. Underdone meat chopped small, and a little toast soaked in strong old ale, will also help to impart spirit to an old bird.

The Final Preparation.

The final preparation before sending off will be very little, if the cleaning of the shanks and heads was done, as it should be, when putting into the pens. If not, it must of course be done now; and in many cases where birds have been prepared and already shown recently, and have been refreshed between by a small grass run carefully kept, nothing more may be needed than to take them up and again cleanse the head and feet; they will not have forgotten their previous training. Where the birds have been treated already, however, and then penned upon a floor of grit and clean chaff, the shanks will now only need wiping over, after which dark legs may be greased with olive oil, but to be wiped as free of it as possible. The face and comb, if bright, also only need sponging over; but sometimes a tooth brush brings the colour out better. After that most exhibitors apply something to the red parts; some using salad oil, others vinegar, or vinegar and water, others cocoanut oil and turmeric. Vinegar is very apt to blister a newly washed comb, and we see many at every show thus disfigured; moreover, though it brightens at first, the comb is apt to go dark ten or twelve hours later. Dilute vinegar is safer, and suits some birds very well, but the best thing for most is plain oil, applied by a bit of soft sponge. Whatever it is should be wiped off as dry as possible. A white lobe must on no account be greased or scrubbed, but gently gone over with a sponge, as gently dried thoroughly, and when dry puffed with oxide of zinc, this too being carefully and softly rubbed off again as far as possible; the object is to dry and soften the skin, not to stain it, and white powder found on it would amount to artificial colouring. Finally the fowl is looked over, any broken or bent body feather removed, and the whole bird groomed over with an Indian silk handkerchief or, failing that, the bare hand. A common handkerchief is useless, but even the hand, and still more a good silk handkerchief, perceptibly increases the polish or gloss of the plumage, so much so that we have thought it might pay to thus groom a bird every day. It is then ready to be placed in the basket. We always did this at night, when it was done peacefully and quietly; and preferred night trains where possible, as usually going through more quickly, but the birds are easily fed, if necessary, in the morning. For the last feed, wheat steeped in hot water, in moderation, is as good as anything. The straw in the baskets, for single birds, should be well bruised till soft, put in deep, and so hollowed out, or deepened in the centre, as to keep the bird there and avoid danger to the tail.

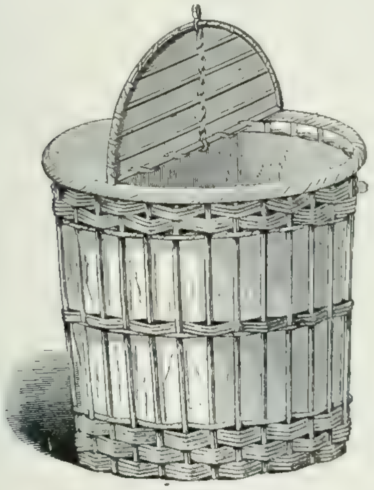

Fig. 83.—Exhibition Hamper.

Exhibition Hampers.

The basket or hamper for a single fowl is a survival of the fittest, and is shown in Fig. 83. The wicker is only a skeleton, lined with coarse linen or calico, or any other cheap material can be used. For very severe climates thicker material, or a double lining, will give more protection on a long journey. The cover should always be hinged in the middle, and is fastened down with string, or soft wire, or sometimes (when not meant for sale) a strap and buckle. Many exhibitors add in the lining a pocket for the expected prize-card. For a large cockerel the proper size is about twenty-two inches diameter and twenty-six inches high, other birds in proportion. Regular exhibitors largely employ baskets made with several compartments, the freight of which comes cheaper. In such cases special care must be taken that each is placed in the compartment under its proper label; every show, almost, presenting examples of mis-penning due to carelessness in this matter.

Treatment after Exhibition.

As a rule, the birds will not require any special treatment after return from exhibition, but should be taken from the basket and given a moderate feed of soft food, also a moderate drink, and then placed in the training pen for the night, or the rest of the day and the night, feeding again before night if necessary. For every one should be most carefully looked over before putting back in the run, lest any complaint may have been contracted at the show; and if the owner happens to know that it has been close to the pen of a diseased bird, a quarantine of a few days may save much trouble. This is only given as a caution, and not a scare, for such mischief seldom follows. If the state of the bowels warrants it, the sooner some chopped green food is given the better, but here judgment should be used, according to any symptoms. Evident constipation and feverishness may be the better for 15 to 30 grains of Epsom salts. If a bird seems quite done up, a tablespoonful of port wine the last thing at night will often give a good sleep and work wonders. More can hardly be needed except after over-showing; but fine specimens are shown by some people till they are regularly broken down, and we have often been disgusted to see a once magnificent cock who literally could not stand in his pen. This kind of unbridled competition, from merely sordid motives, is simply sickening, and there is too much of it in certain circles. If a bird comes home apparently done up, or on the verge of such a breakdown, give it at once one of Henson's cuca pellets, or a third of a teaspoonful of the same chemist's fluid cuca, or a teaspoonful of Hall's coca wine, and another in the evening or after three hours. Cuca extract is much used by cyclists, and (in reason) we know it by experience to be a wonderful nerve restorative; but to go on with it, keeping up the strain continuously, and trying to remedy the effects by resort to drugs, means even worse ruin in the end. The only real remedy is rest.

After a crowded show, it is safer in winter to shut birds up in a dry shed for a day before allowing them out, to harden them a little towards the open air. It should be needless to repeat that a cockerel once taken away and shown cannot be returned to his old companions without a fight; and such a fight under the circumstances involves considerable danger of apoplexy, the bird having been highly fed and in exciting surroundings. We have personally known three cases in which birds thus carelessly treated have dropped down dead, almost before a blow had been really struck on either side.

Profit and Loss of Exhibition.

Some exhibitors who reduce showing to a regular business system, differ much as to the manner in which they make it pay. To get any remunerative sale at all for prize stock, the owner must show himself capable of taking fair rank in the exhibition ring; but it is sufficient for this if honours are consistently taken at the few great shows of the year. Many of the more genuine amateurs confine themselves to these, which do not overtask their best breeding birds, and are quite sufficient to keep up their reputation. Beginners generally try first in easier competition, and there are plenty of second class but still good class shows, at which a few wins gradually get a new name recognised. But there are a distinct class who buy to exhibit, and exhibit the bought stock constantly, reckoning to get their money back out of birds before they have used them up, and at the same time keep their names before the public. The increase of these regular circuit-goers during late years has very much affected the poultry fancy and exhibition matters generally. These men have vast experience, can appraise their birds as well as any judge, and rarely waste entry fees. Some of them act as judges in turn, which at times provokes scandal. A certain number of them make exhibiting itself pay well, often picking up first class birds cheaply at out of the way shows, in their visits to nearly all; and to some extent arranging in concert where they shall appear, and forming a sort of inner circle of their own.

The majority of skilled breeder-exhibitors probably about make their prizes pay entry fees and carriage. That more is almost impossible, may be seen at once on comparing the average sum given in prizes to a class, with the fees and average freight charges added up of the entries in that class. But it pays in countless other ways—by promoting sales, by keeping up personal connection, by constantly keeping the eye and judgment in training, and by opening the way to advantageous purchases and sales. Many of the best sales are made personally at the shows. The novice cannot hope at first to clear his expenses. But he may reduce these by training his own critical faculty, and sending only the pick of his best birds, in good condition, till he feels his feet and finds his place. Notwithstanding what is said above as to the "inner circle" and all the rest of it, the field is as open as ever to real merit, and upon the whole this gets fair play. If certain exhibitors do appear at times to "sweep the deck" to an extent almost forbidding, it is to be remembered that they have often bought their champions at very high prices indeed, and thus make much of his market for the breeding exhibitor, who would not like to lose those high prices, which only winning enables them to pay. It is quite a complicated system now, and not free from evils; but we still on many occasions see the honours fall to previously unknown exhibitors with new birds.

Exhibition Value.

The exhibition value of birds bought mainly for exhibition, depends on circumstances, as well as upon the real quality. Some varieties have a class of their own at every decent show, while others, even of the same major breed, will often have to go under "any other colour," into one mixed class besides the leading one. There are breeds, like Hamburghs, where all varieties often compete together at the smaller shows. And there are breeds—even old recognised breeds like Spanish, Malays, Polish, or Scotch Greys—which have now at most exhibitions no separate class, but compete in that for "Any other Variety." This great inequality in the chances of a prize considerably affects the exhibition value. It is useless to more than hint at these points; but the hints may serve to show how much has to be considered and learnt before investing heavily in this line of business.

CHAPTER XIV.

SHOWS. JUDGING. TRIMMING. TECHNICAL TERMS.

THERE is no need at this date to enter minutely into the details of show management; but a few points in which improvement is still often desirable ought to be mentioned. Penning and feeding are generally contracted for now, and many old errors are corrected; but we are bound to say that *cleanliness* does not seem nearly so well secured now at the great shows as formerly. In the 'sixties it was usual to cover the floors with chaff, which kept the plumage clean; but the birds were at that time generally fed on grain, and the absence of grit was prejudicial to health. Grit is now substituted at most shows, but with nothing else, and the birds too often become filthy. A very small quantity of grit is required, and if this were covered with chaff, as we have indicated for the training pens, the inmates would be kept in perfect health and cleanliness so far as flooring was concerned. This is not too much to ask of a show committee; but we have attended one of the largest shows of the year where the pens were not even cleansed daily. We have seen still worse effects, though fortunately this is more occasional, from gaps carelessly left between the boards which, in most shows, have to form the roof of the lower and floor of the upper tier; the filth from the upper will descend upon the occupant of the lower pen, with results too well known to many an exhibitor. Usually a wash when the bird gets home will remedy matters; but we have seen cases, at the Crystal Palace itself, where copious discharges from above have corroded the plumage so as to absolutely ruin birds for the rest of the season. We are not sure a committee, and through them the contractors, might not be made liable for damages in a case of this sort, since such evils would be absolutely prevented by the simple expedient of half-lapped or match-boarding.

Cleanliness.

Feeding is much improved compared with early practice, and at least one feed a day of soft food is generally given. Still there is room for improvement, this being usually biscuit meal, often scarcely moistened. It is very much better, though rarely done, to mix a certain portion of barley meal or oatmeal or ground oats with it, and mix it properly, so that it can be eaten comfortably without all falling to dry meal on the floor. It is also still the usual custom to fill the water tins for the birds on arrival, which they will often drink entirely, to their serious injury; in particular such thirsty drinking has a uniform tendency to darken, it may be to almost blacken, the combs. A third full is quite enough for the first drinking. The whole grain—wheat is best—is much better supplied in two small feeds than one large one, and gives the birds some exercise and occupation if well scattered about the pen, as it should be, not just thrown down.

Feeding at Shows.

We hardly know a show yet where green or fresh vegetable food is given. It would be much better if it were, and really very easily managed by such firms as do the contracting now, by slicing up roots into small dice in a hopper machine, and giving a sprinkle to each pen. This is almost the only thing worth fussing about by an exhibitor personally. Should he be attending the show, it is well worth while to take in some lettuces daily for his pets, and a little chopped meat will not come amiss if they have been used to high diet; but it is worse than useless to fuss about mere food, as some seem to do, apparently anxious lest their birds get enough. They may rest assured that they are far more likely to be overfed than underfed, while they are much better underfed than overfed; only such *extras* as mentioned, which are probably missed, are worth attending to if occasion serves.

The most important point in some respects of good show management, absolute fair play to all, is unfortunately lacking at many shows, particularly in regard to allowing exhibitors or their men to pen their own birds. This manifestly gives such birds a considerable advantage, since—to take only one point—their heads and combs can be "freshened up" at the very last moment. These men very often make large entries, and are well known personally through a

Unfair Privileges.

large circle all over the country, and it is easy to see how strong is the personal pressure in favour of granting such advantages. But they are distinctly unjust to such as have to trust their specimens to railway and show officials; and there are, moreover, occasionally distressing cases of malicious injury to formidable exhibits sent unprotected, which can hardly be due to any other than some of the parties thus illegitimately admitted. Things are not as they have been painted by some for reasons of their own, and supposed by others to account for their own want of success; but unbridled rivalry and the business interests at stake in some quarters are the greatest curses of the poultry fancy, and such admissions and favours present too many opportunities of several kinds to just the class which it is most undesirable should have them.

The same rule should be applied to packing birds when the show is over; and for the same reasons constant supervision over every alley or promenade in the exhibition should be maintained. This ought to be a travelling or peripatetic supervision, if only to see to the prompt removal and breakage of eggs laid; if they are long left in the pen, breakage is sure to occur there, and the bird may acquire the habit of egg-eating. It is also necessary to prevent unauthorised meddling with exhibits, which in the exhibitor's absence have an absolute right to be protected from all rival exhibitors, so far as their private capacity extends. On the contrary, we often see birds allowed to be taken out of their pens by rival exhibitors, quite unchecked, at even first-class exhibitions. This is simply disgraceful, and must damage the plumage, if nothing else, for which reason it is no doubt often done. If any fraud is suspected, it is right and necessary for the matter to be investigated; but this should only be upon due protest, with caution money,[*] and in the presence and with the sanction of officers and judges—at least one of each. We have actually known an exhibitor, on his own mere motion and responsibility, take out a buff bird belonging to a rival in the same class, and apply what he presumed to consider a "chemical test" to the plumage, a test which was worthless as such, but which dyed the plumage afterwards!

A point merely of good management, but which is too often neglected, is the sending notice of all *sales* of pens exhibited, at farthest the same evening on which the show closes. Neglect of this causes endless anxiety when the sold pens fail to arrive along with the others. Where a show lasts more than two days, notice ought to be posted every evening of sales made during the day.

Notice of Sales and Awards.

At Birmingham a list of sales is posted outside the office, and also the awards as handed in by the judges from time to time. Whenever the public are admitted during the judging, or on the first day at any time, this prompt posting up of the awards, from which exhibitors can mark their blank catalogues, and the prompt posting of the cards upon the pens themselves, is of the greatest importance, but not always attended to as it should be; at the largest show of the year we have on some occasions known many awards not to be obtainable even at nightfall, though handed in long before.

Open Judging.

The question concerning what is called "open judging" will lead naturally to the next section of this chapter. All exhibitions of poultry were at one time privately judged; but the public judging of cattle and horses doubtless started the other idea, and Birmingham first began the system, since carried out at most of the larger and some even of the smaller British shows, of admitting the public at an enhanced fee "to witness the judging." The judges themselves at first much objected to the new method, but experience has endorsed it, especially as a check upon the unauthorised influence of large and habitual exhibitors, as above alluded to. When we say that we have ourselves seen, at the chief show of the year, a large exhibitor acting practically as "steward" (or manual assistant) to one of the judges, and that this would *not* have been seen except for the "open judging," solid reasons for the system will appear. Of course the class which is actually being judged is always temporarily fenced off from the public, who can only watch the proceedings from the ends of the alley or from adjoining alleys, and the judge is not impeded, though his proceedings and method of work are under review. What the public really care most about, however, is the earlier knowledge thus possible of the principal awards, in advance of the published prize list, and which to some of them may be of considerable importance. The higher fee for admission also ensures a less crowded and more quiet examination; and for all these various reasons "open judging" is likely to remain an institution at the large shows. Except under such equitable conditions, open to all alike, exhibitors ought to be most rigidly excluded previous to the admission of the general public.

[*] At the best English shows it is usual to require a guinea with any protest on the ground of fraud, which is not returned if the protest be decided to be frivolous and unjustifiable, as some are. The fee is of course returned, if either the protest be sustained, or even if not sustained, if the authorities consider there was fair, *primâ facie*, or plausible ground for it.

Good and upright judging is the greatest object to be desired at all competitive exhibitions. In poultry judging very great changes in method and practice have taken place since the first edition of the *Illustrated Book of Poultry*. At first it was customary to exhibit a cock and three hens, and after that the rule was a cock and two hens, known as a "pen" of birds. As a pen rarely contained the best in all its inmates, this made judging complicated, and often questionable. For years after that, when the males were separated, a pair of hens or pullets were shown together, and we often find ourselves still regretting this, as a better test of the breeder's skill; though on the whole single birds are better, both for the exhibitor, and in making the judge's task so far simple and clear.

Changes of Method in Judging.

The early system of judging differed entirely from that known to the present generation of exhibitors. At the time we speak of, two or even three judges always acted in concert, and excepting one or two of the very largest, usually made all the awards through the entire show, in all classes alike, often arbitrating upon as many as a thousand pens. This system was only possible on account of the little general skill in breeding at that date, which made a few good pens stand out so clearly from the rest as to be selected with far greater celerity and ease. Even pens worthy of being "highly commended" were scarce in those days, so that at a large show even such cards had a considerable money value in selling stock; and it was easy for any judge then to judge more than double the number of pens he could possibly manage now. The gradual increase of birds of real merit made necessary the suggestion of an extra grade, originally due to us and now everywhere adopted, of "very highly commended" cards, of which it is understood that such a card, however freely bestowed, should be restricted to specimens not unworthy of a prize in a good class, but for which prizes are not available. Since then a yet higher grade has been invented, in a "reserve" card, ranking next after the actual prize list, and which also has conveniences should any prize bird be disqualified after judging. At the Crystal Palace show as many as ten actual prizes are sometimes given in a few of the principal classes, and there will be "very highly commended" specimens outside even of these. Such great changes in the very conditions of competition, which many of the younger generation can scarcely realise, may make clearer how it was that one or two pairs of judges could at that early period perform with more or less efficiency a task which no judge whatever would dream of attempting to-day.

Evils of the Early System.

But another reason was the entire absence of public criticism, and therefore of any due sense of responsibility. Even the nominal responsibility was joint or corporate; and if anyone protested, with evidently much reason, against some award, Jorkins said it was Spenlow's fault, and Spenlow said it was Jorkins's. This was convenient, and created in both an indifference to dissatisfaction which at times was almost lordly in its grandeur, since there was absolutely no check upon it. The prize list, and one or two lines (from one of the judges) as to whether a class was good or poor, or some particular pen "very fine," was all that appeared in the one or two journals which gave even so much to poultry shows; of independent skilled criticism there was none. The evils resulting from all this had become manifest, and led us from the first, as soon as able to exert any influence in such matters, on the one hand to advocate single judging, each judge being solely responsible for his own awards and those only; and on the other to endeavour to show by actual example what intelligent criticism of exhibits and awards, so detailed as to be capable of being itself judged in the light of day, might and ought to be.* The first innovation we felt would halve the work and double the efficiency of the judging staff; the other must in time enforce a more serious sense of obligation and duty. Both expectations have been realised, and have gradually worked a revolution in this department of poultry exhibition.

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* Our critical notes upon a few of the principal shows in the *Journal of Horticulture* (then the only British poultry organ) for several years previous to 1874, were the first and only ones attempted up to that time. They were then succeeded by similar ones over a wider area in the *Live Stock Journal and Fancier's Gazette*, which was for years, and while under our direction, the leading poultry organ in Great Britain. In these we still shared, but aided by a staff trained as far as possible to follow the same system, the essence of which was not to pronounce mere dogmatic opinion, but to give details and reasons, above all whenever any award was seriously questioned. Thus was commenced that method of show reporting in England, without which the present vast exhibition system would speedily languish, and whose present scale may be judged from the fact that a current issue of *The Feathered World* contains reports of 35 shows, occupying 63 large columns of small type. Our own reports testify that in every case we gave detailed reasons for any opinion expressed, but that on no occasion is there a word to indicate that any exhibit of our own ought to have stood any higher than it did. It can be stated now without offence, that this is no small boast. The fact will seem strange to-day, when no judge dreams of resenting criticism that is part of the accepted scheme of things; but it is a fact, that in those earlier years they did—especially the two of them who judged the greater number of shows at that time—fiercely resent having their long unquestioned infallibility called in question; and as soon as our personal share in it became known, they taught us effectually that it was absolutely necessary either to cease from our criticisms, or from telling the truth, or from exhibiting under them. There were other reasons, including heavy pressure of work; but that was the main reason which drove us out of breeding poultry for exhibition. That the price had to be paid is some measure of the work that had to be done in those days, and of the necessity for doing it.

Evils of the Modern System.

Though the gain has been great upon the whole, however, it would be a mistake to suppose it an unmixed gain. It is all gain to have an adequate number of judges—forty, acting singly, were employed at a recent Crystal Palace Show—who can therefore take adequate time. It is great pain to know that any considerable miscarriage in the awards is pretty sure to be detected by the skilled reporters of the poultry press. But the very number of arbitrators now required, and the necessity imposed by fiercer competition that many varieties should be judged by those who possess a breeder's knowledge of them, and the far greater number of shows, have introduced some evils of their own. A large portion of the judges are necessarily now drawn from the ranks of exhibitors themselves, and this has had a perceptible tendency towards the creation of certain circles, or "swims" as they might be called, whose members work in with one another, and reciprocate favours. We have seen too evident signs of this, especially in certain Midland and Northern districts of England; and there are one or two judges to-day, of undoubted ability, who have never gained a good reputation. As regards the larger shows, grave miscarriages are kept in check by the press, whose vigilance holds minor matters also under control; but such vigilance has certainly been required, and cases of mutual favour do undoubtedly occur. The old school of judges were most certainly not above showing personal resentment, as we too often had occasion to know,* but they were mostly far above mutual "understandings," doing their work chiefly for the love of it, or for the prominence it gave them. There has also been evident of late a kind of competition for public favour amongst some who act as judges, not altogether pleasant to a disinterested onlooker; evident attempts to *pose* as possessors of superior knowledge, or of greater honesty of purpose and zeal for purity, at the expense of others whose uprightness and capacity are quite as great. It is well to open one's eyes to all these things, and amongst new conditions to seek for the highest ideals of the older school, so far as those were good. But upon the whole modern poultry judging, carried out as it is by an adequate staff of practical men, under the vigilant eyes of a whole staff of skilled critics, is better and more consistent than the old, and any clear miscarriage is sure to be canvassed in the poultry press, which in the long run ensures that justice is done.

Press Criticism or Reporting.

This naturally leads to a few words upon press criticism, or show reporting, which needs quite as much care to keep it up to a high standard as judging itself. The question of anonymous or signed reports has been much discussed at times, but it is hardly worth discussing. A journal of repute, with adequate means behind it, makes itself responsible for its unsigned reports; and when the character of its conductors is known, that of itself is the best guarantee. On the other hand, sometimes it is an advantage if the criticisms on some important breed at an important show are signed by a name of well-known weight, possibly greater than that of the judge; and there can be no possible objection to it whenever thought advisable. On the whole, we think that anonymous criticism under editorial responsibility is the best general rule; and this opinion is the result of many years' experience. But the system cannot be divorced from editorial responsibility; and although the painful necessity only occurred to us upon two or three occasions in six years, there should not be any hesitation in acknowledgment and frank repudiation, whenever any abuse of a reporter's position has been fairly proved.

In the early days of critical reports the judges often (especially at show dinners) used to scoff bitterly at the presumption of careless critics who, as they said, in a "skurry through the classes" assumed to "set right in an hour what had taken the judges the whole day." There was here both a misrepresentation and a misconception. Being present when the above words were used at Birmingham, we had the curiosity to make examination at the hands of the stewards, to find that our rough pencil notes on the Brahma classes, at that very show, had occupied us *longer* time, by a good proportion, than the two judges had taken over them! But a really competent critic is also in a better position to judge, from the nature of the case. He has the judge's work prepared for him as a basis, and in the second place he has a catalogue. The latter, with its names, places him in a position of very great advantage in many respects, if he really knows the breed and its chief breeders, as he ought to do. It teaches him what to look for, in so far that good points usually shown by a given breeder are not likely to be overlooked by him. He has no motive for disagreeing with the judge (apart from any special cause of jealousy, against which his editor will of course be constantly on the watch), but will rather desire to agree with him; and with all this help he is really able, if of the right sort, very often to form the best judgment. It is not at all that he is personally the better judge; on the contrary, if he were the judge and the other man the reporter, then the latter would be in the better position, other things being equal.

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* After we had personally ceased to compete at shows, as stated in a previous note, one of the most valued members of our staff was compelled on one occasion to take serious objection to an award, the judge having himself sold the birds to the exhibitor, which occasionally happened even in those days. He consulted us over the pen, and we have not the slightest hesitation in saying that his strictures were both perfectly legitimate and imperatively called for, while he was not himself exhibiting at all on that occasion. For a year afterwards that reporter was treated unmercifully as we had been, though confessedly the most eminent breeder of the day; and the judge concerned carried his almost constant colleague with him in the same course. After about a year of it, the reporter at last went up boldly to the judge and said, "Mr. * *, don't you think you have about taken it out of me for that —— report of mine?" The judge laughed, simply replied "Nonsense," and turned away. But the appeal was successful, and the next show at which he appeared found our reporting friend once more in his accustomed place, somewhere near the top of the tree. This judge was a very large seller of the stock he judged—as bad a case as any now, though such was then decidedly the exception. Both parties are long since dead, and this statement can now harm no one.

So great is this advantage, that we have for long been inclined to advocate placing catalogues in the hands of the judges themselves. Transcribing words written so long ago as 1875, "Whatever may be said as to a good judge being able to judge a specimen without knowing whose it is, after many actual experiments made as fairly as we have been able to make them, we are more than ever convinced that it is much easier to form a just estimate of the real merit of a class when in the full possession of such particulars as a catalogue affords, than without them. We feel this so strongly, that oftentimes we have felt almost ashamed to find fault with the work of gentlemen who have had to decide under such disadvantages." It is, of course, easy to ask what guarantee there would be for impartiality under such a frank system, and it is not easy to reply; but, on the other hand, one may ask what guarantee there really is under the present, beyond the character of the judges. That these recognise many exhibits from memory, and are glad to catch at such a memory as leading to awards which shall at least appear "consistent," is notorious. That judges of "shady" character do also get to know the exhibits of their friends, is equally so; straws or chaff in the pens, handfuls of grit, etc., have been identified as methods of telegraphy. Now the main evil of this has lain in the fact that the judge who really did know was supposed—but only supposed—*not* to know; if he was challenged he affirmed that he knew nothing, and had done his best honestly, the merely presumed ignorance being thrown over his collusion as a shield. If he admittedly knew all the entries, that excuse would be stopped; he would have no defence but the real merits of his award. and his own interest might compel him to guard against suspicion of being influenced by mere names. However, the present point is simply the vantage ground thus occupied by a really competent and skilled reviewer of the judge's awards.

Essentials of Good Criticism.

Two points—we write it from long and ample experience—need constant care, as regards critical reports: Impartiality and competence. The principal journals keep a certain staff in their permanent employ, who are quite independent; but no journal can adequately report the great number of poultry exhibitions now, without the additional aid of some who are themselves exhibitors. Many such make the very best of reporters, from special knowledge of their special breeds. But flesh is weak; and if anyone upon this outside staff of a journal is found stating or hinting in his reports that his birds, or the birds of those whom it may gradually be discovered are his friends or colleagues, do not get their deserts, or should stand higher, the position is abused. It is equally abused if an exhibitor is found bragging of his commission, or using it to obtain favours from breeders, or to obtain admission where he has no business to be, or to handle birds as if the show belonged to him; all which things have happened. A competent and scrupulous reporter will always be quiet and modest in manner and proceedings, and take care to keep himself on safe ground by procuring official presence and sanction for any examination which he deems it his duty to ask for. One or two offences may pass, as the result of inexperience or want of consideration, but should receive notice and caution; if such a course be persisted in, a journal that values its reputation will sever the connection, in discharge of its own duty and responsibility to the poultry fraternity. That there are fairly honest and very skilful critics who yet succumb to such temptations we know; that there are some who rise above them, quite sinking the mere exhibitor in the critic for the time being, we also know; and it is a serious part of the responsibility of a poultry journal to know the staff, who hold so much of its reputation in their hands.

Competence or ability also requires sedulous concern. Many most capable and honourable critics cannot write genuine "criticism" without hints or training, and much that is published is far from what it ought to be. Unless upon occasions when his notes are signed, and thereby carry the weight of his own name, like the decisions of the judge himself, it is sheer presumption, almost impertinence, for a reporter merely to say that an award is wrong, or that some other bird ought to have received it. We still see more than enough of this ; but it is only dogmatism, and not criticism at all. The latter ought to be so definite and clear that the reader himself can judge to a great extent of the question at issue. A judge almost always has fairly evident reasons for his judgment ; and the reporter's business, whenever he questions this, is to discover and state such points, along with those which in his opinion overrule them. Often the case may be one on which opinions are much divided. When no award is questioned, much less detail, or even no remark at all, may be necessary ; but all questions really raised should be fairly stated, especially in regard to important classes at an important show. Such a report upon a class, with such a discussion as is likely to follow in any important case, may clear the air and affect breeding operations through the following year. We have often seen this the case, and it is another of the advantages of the modern system of public criticism.

Sources of Present Evils.

Taking the whole system as it stands, it may safely be said that, upon the whole, judging is very good, so far as the principal exhibitions are concerned, which very often could not be said of the irresponsible work of pairs of judges as we knew it in 1865–75. There must always be some downright mistakes, and we fear there will always be some downright rascality, both in judging and reporting. It is mainly at smaller shows, which the most able press reporters do not attend, where anything in the shape of gross abuse is practised. It is at such shows that a judge ventures to give prizes to birds he has just sold, or even lent from his own yard, or to the friend who gave *him* first prize the other day. It is such shows as chiefly, in order to save adequate fees, employ judges of this stamp, who take low fees, or even act gratis, in order to make their money in other ways. This class of men and their chief colleagues and supporters are perfectly well known, but it is in the absence of publicity that they carry on their operations, and there is a class of shows in England which it would be most desirable to extinguish altogether ; in default of this, the genuine amateur will do well to sedulously avoid appearing at them. But at the majority of important shows the judges are competent men who know the breeds they undertake, and who do their best ; and these are checked by the keenest eyes in the exhibition world, quick to note any evident miscarriage. Between the two justice is done, and the newest exhibitor, if he shows a good pen, at any of what we may call respectable shows, may beat the veteran of years ; we have seen this happen often. Transcribing a few lines we wrote in the first edition of the *Illustrated Book of Poultry*, we repeat that "It is not from *judges* of doubtful integrity that the greatest dangers to the poultry fancy are likely to arise, but rather from the reckless and debasing rivalry which, without either honesty or courage, seeks to *win* as the sole object of keeping fowls, and sticks at no means to accomplish this paltry end."

The method and standard of judging have been subject to debate for years. It was some time after poultry exhibitions were established before there was any standard at all ; individual judges simply had their own idea of what a given fowl should be, and selected what they considered "best" by the light of nature. This was made possible by the fewer relatively superior birds of those days. These stood out and spoke for themselves, and gradually evolved such type as was recognised, under the few judges who judged practically all the then existing shows, and who therefore had matters almost entirely in their own hands. Their opinion, gradually crystallised during practice, was the first unwritten "standard" of poultry for exhibition, but had no fixed expression.

The First Standard of Excellence.

About 1865 a Poultry Club was formed in England, but did not secure many adherents, and was speedily wrecked by the personal animosity which developed between one or two of its members. But it issued a description of the recognised breeds, with numerical values for the points, under the title of "The Standard of Excellence," which was a land-mark in the judging of poultry. In spite of many faults, it embodied the principle that fowls ought to be bred to definite points, and judged by them, and that the points could be and ought to be defined. This was a great idea, and a great service, though the first Club's existence was brief and its "standard" very crude. The scales of points only added up to a total of fifteen through all the breeds, which quite shut out the modern system of "cutting" a portion off for defects ; and in the descriptions themselves were several errors—such as attributing red eyes to Malays —which however could scarcely be avoided at that early period. The existing judges ostentatiously declined to be bound by this standard, which had in fact no authority; yet nevertheless its definitions or descriptions undoubtedly had great influence in bringing about greater uniformity of type, and more general acceptance of a real type, in many breeds.

The American Standard of Perfection.

This influence was accentuated by a Poultry Convention held at New York in 1872, which issued an American "standard." It was mainly based upon the foregoing as regarded the descriptions, but increased the total numerical value of the points from 15 to 100. This was an alteration of cardinal importance; because the value of every point, being now multiple, admitted of being diminished (or "cut," as the Americans term it) for defects in fair proportion. Hence it was held that if the values of points accurately represented proper judging, and they were equitably cut or diminished for any defect, the adding up of the lowered figures, or the "score" of the bird, as it was called, scored on a card, would give the proper relative position of every pen. The convention was reconstituted soon afterwards as the American Poultry Association, consisting of delegates from all parts of the country, and which revises its standard every five years in open session. This is now termed, as in England, the "Standard of Perfection," and in its present descriptions, as well as values of points, differs from the first English standard pretty widely. The Association also controls the naming and admission of any new varieties to the American Standard, and such a history as that of the Buff Orpington in England, for instance, would in America have been impossible. A few remarks on this standard and its method of application will be found a little farther on.

The "Illustrated Book of Poultry."

In 1874 the first edition of the *Illustrated Book of Poultry* was completed. In this was included, under the title of "Schedules for Judging," a standard of our own which embodied several new features, the result of many trials and much practical checking over, before competing pens. First, its basis was different; for whereas both the previous ones had embodied the "views" of their compilers, we had taken these, or our own revised "views," as a starting point only, and endeavoured to ascertain *how far they were borne out by the best judging*, as accepted by public opinion, which was by this time crystallised into fairly definite shape. Our experience was that what appeared beforehand to be reasonable comparative value of points, in many cases could not be harmonised with evidently correct judging, so that the standard should place the birds in the same order as the judges did. We would then attempt to modify figures, or their definition, so that the two should harmonise; and the modified result was checked again on the next opportunity. Years of detailed criticism at shows had prepared us for this work, in which considerable practical success was ultimately obtained; and our figures were eventually published, though avowedly upon merely personal responsibility, not as embodying our own opinion—for in many points they differed widely from what we would have preferred, and even had previously supposed—but as *an analysis of the average actual judging in England*. A second point of difference was, that we were subsequently led to prefer as a system the tabulation of defects rather than of positive points. The third was that, whilst we started from a total of 100, many analyses led us to give considerably *more than* 100 to the total of possible defects, fully added up together. The reason was that while points must have a certain proportion to *one another* comparatively, in order to represent correct judging each point must also have a certain proportion *to the* 100 *of perfection*. We found often that, if only 100 was divided amongst them all, proportionate deductions according to the amount of defect did not deduct *enough* to give always the true order of merit, as a good breeder-judge would reckon it; whereas raising the numerical value of all points proportionately to some higher ratio, brought nearly all such irreconcilable awards into line. Such were the main features of our own standard of 1874.

It is only the bare truth to say that this standard has exerted profound influence on all those of the present day, with the exception of the last feature above mentioned—its excess of total added defects, over the standard total. The reasons for that, proved too subtle to be grasped by the majority of breeders, and we are now convinced that the simple 100 point system is the only one capable of general acceptance, while it will give true results in the majority of cases. The reasons for the other are, however, as real now as in 1874; and if any fancier of a mathematical turn of mind will, on the next exceptional occasion when he cannot possibly square the order of merit per standard with the evidently *correct* decisions (for it is no standard's business to square with bad ones) of the judge, make the experiment of deducting considerably *heavier cuts* than the 100-point scale seems to allow, he may probably understand what we mean. Our numerous revisions in description have been mostly adopted in substance, where not in words, on both sides of the Atlantic.

Finally, the system therein adopted, of tabulating points of defect instead of positive merit, has not only been adopted by the Poultry Club of Great Britain, but the American Poultry Association also, while not adopting it in the scale, has in its "instructions" and the table entitled "Cutting for Defects," practically accepted the idea, as regards actual use of the standard. No one can compare the English and the American standards as used in 1872 with those of today, without seeing how these schedules of 1874 have influenced both. They were, however, expressly put out as individual and temporary; and having now accomplished all the purposes hoped for, it is with satisfaction that they are discarded for those adopted by a body having real right to express the opinion of the chief breeders and judges in the United Kingdom.

The Poultry Club's Standard.

The present Poultry Club was established—for it was an entirely new body, not a resuscitation of the old—in 1878, mainly by the exertions of the late Mr. Alexander Comyns. For some years it attracted comparatively little support, owing to some undoubted mistakes in policy, and various other causes; but in 1886 it issued under his editorship Part I. of a new "Standard of Perfection." This included Cochins, Brahmas, Dorkings, Game, Houdans, Crêves, La Flèche, Courtes Pattes, Polish, Minorcas, Leghorns, Plymouth Rocks, and Andalusians; and was intended to have been followed by Part II., containing the remaining known breeds. This was, however, hindered by minor causes, and finally prevented for the time by the illness and death of this indefatigable editor and secretary of the Club. By the time the project could be taken up again, English judging itself had perceptibly changed in some respects, the Club had become much stronger and more influential, and it was thought better to undertake a new standard altogether, using and incorporating any existing material, including many standards already drawn up for single breeds by special clubs, as far as found desirable after conference and consideration. The work was only seriously commenced in 1897, under a Standards Committee appointed by the Club, with Mr. T. Threlford for secretary. Progress was necessarily rather slow, as the number of special clubs who had framed their own standards independently of each other necessitated considerable further labour in reducing the whole to one common method or pattern. But it was finally completed and published in 1901. In 1910 the entire work was again revised by a small sub-committee, with Mr. W. W. Broomhead as secretary, and these new standards are also, by arrangement with the Club, incorporated in the following pages.

The Use of a Standard.

As regards the proper function, and proper method of *using* a standard, and the method of judging in itself, there are the widest differences of opinion, ranging chiefly into two schools on the two sides of the Atlantic. All would now agree that the accepted standard should be regarded *as* the standard or canon of a breed, subject only to detected and obvious accidental errors, or to authoritative revision; and this alone marks distinct advance upon the state of things existing thirty years ago. No judge would now claim a right, as many did then, to ignore the standard altogether. Nevertheless, in England the eye and judgment of experienced and qualified judges have always been preferred in determining awards, and it has never been customary for any of these, that we know of, to consult the standard on the spot. A few judges always have, in cases of doubt only, used scales of points arranged by themselves. The late Mr. W. F. Entwisle furnished us with the scale-card for Game and Game Bantams used by him in difficult cases, which we were not surprised, though he was, to find in closest agreement with what we had already drawn up; and the late Mr. John Douglas also used a scale of his own in similar circumstances, for the same breeds. But in the main such standards as have heretofore existed in England were regarded as more descriptive than anything else. The definitions have been accepted, but the judging has remained personal, under the system of organised public criticism already reviewed.

One reason for this was probably the want of authority in previous standards. The framers of the first worked with the avowed idea that the points might be added; but their number of points was impracticable, and the sponsors were too few in number to have any authority at all. Our own scales never pretended to any, being only intended to pave the way towards something more authoritative, which might, it was hoped, be framed in due time, as is now the case. Hence the English system of personal judging continued of necessity till an authoritative standard should be adopted, and barring occasional abuses (which are not confined to this system), we doubt if there is better or more consistent judging in the world. But there was another subsidiary reason. Owing to the same absence of authority, there have been considerable *changes* in type amongst many breeds. In some respects this is an evil, and when carried to such an extreme as from nearly bare legs in Asiatics to heavy vulture-hocks, it is absolutely pernicious; but in smaller degree there are constant fluctuations as to the faults which prevail at a given period, and thoughtful breeders have held it distinctly desirable that a judge should have freedom, and be able to lay more stress upon some fault which is becoming prevalent, and which it is therefore desirable to meet with a more decided check.

Score-Card System in America.

In America it was different. Though the same imperfect standard formed the original basis there also, its total "points" were from the first raised to a practicable figure; the most evident errors were corrected, and it was adopted in public convention, with the intention, from the start, of being actually put to use. There was not available a *personnel* with the knowledge and experience of English judges, and such judging as had been possible had given ample cause for dissatisfaction. Here, therefore, the experiment was made under far more favourable conditions. We did not at the time think it practicable; but the event proved otherwise, and set aside all *à priori* British notions, for the leading American shows were actually judged by standard and score card for years, and the judging became admittedly far better and more consistent than it had been A printed score card is under this system supplied for every pen, on which the "cuts" for defects are written for every point, and the totals added up, and when this is done the prizes are awarded accordingly. Experienced breeders are able to score their own birds pretty nearly; and a system has moreover grown up of selling birds by their "score," and of judges, for a fee or otherwise, "scoring" specimens for the express purpose of sale. The development of the whole system is both interesting and instructive, and proves that judging in this way is perfectly practicable under the necessary conditions.

Reaction Against the Score Card.

Nevertheless, there has been some gradual reaction against it, and in favour of the English personal system, termed in America "comparison" judging. We will not venture to predict the ultimate issue, since the reaction itself may be only a temporary phase; but during the last few years one after another of the largest American shows has returned to the personal system, and the subject is one constantly discussed in American poultry papers. The first reason for this reaction was undoubtedly that of *time.*[*] Again and again it happened that the scorings and consequent awards were not completed even when the show closed! That would never have been endured in England; it began to be unendurable in America. People wanted to know what had won, while they could still compare the birds. There were probably further reasons, in what we think the unsatisfactory scale of cutting laid down in the standard itself, as immediately indicated; but however this may be, the whole question is now matter of debate. It is curious to observe that one of the chief reasons for maintaining the score system, constantly urged by very many of its advocates, is its cash or selling value to the recipient of the score card. The writers aver that they can *sell* upon a score card, whereas they cannot upon a mere award, unless it be one of the prizes. This they term "intrinsic value" of the score, and so long as it really exists it will probably keep the score card in favour. But the press has been full of cases of the alleged worthlessness of fowls scored fairly high in this way; and altogether we would not like to predict the system of American judging ten years hence.

Faults in American Scoring.

Part of the reaction, as we have already said, we think is due to the faulty method of using it laid down for judges in the standard, and which might be improved. In many cases, when birds had been duly scored and placed by it, somehow or other (except the winners themselves) *no breeder preferred them.* Something was wrong; and it is pretty easy for any student in these subjects to see what it is. Another proof of the same error lies in the absurdly high scores which are the present result. Scores of 96 are habitual, and the standard itself lays down that no bird below 85 should receive a prize, and that a first prize ought to score 90 or more. All English breeders, who are (allowing for differences in their standard itself) quite as skilful as American, know that such approximation to perfection is not in practice generally attained, upon any valid system properly carried out; and will know equally that even 92½ birds (92½ seems quite an orthodox and customary "selling score") are not really plentiful as blackberries, though in America they are made to appear so. But when we come to the directions given to judges, the mystery is made clear, for many of the "cuts" made as directed in the standard are obviously far too small. Judges are "asked," if they find too few or too many serrations in a comb, to cut half a point for each; if side sprigs, one point for each; if a thumb mark, not less than one; if rear of comb "turns around," one point. Now take a Minorca with a twisted comb and two spikes too many, enough to give him what in England are called "pencil" serrations; one point deducted for the pair of them, or three points in all if, beside, his comb "turns around" at the back and has a thumb mark, still leaves him 97 points, though no breeder would have him at a gift. This is perfectly absurd, and sheds considerable light upon "intrinsic value" and the high American scores. There is plenty more of the same sort. Take absence of sickles in a cock; the judge is requested for that to cut one point for each. Take, again, an absolutely bare middle toe in Brahmas; the judge is to cut one point for each—each foot we presume. Take, again, eyes: for permanent "injury" he is to cut half a point; for an eye totally "destroyed, leaving only the socket," one and a half points. It is manifest enough that such trivial deductions for such faults are merely nonsenical, and cannot give judging which will permanently satisfy.* Some alteration will inevitably become necessary, sooner or later; but whether in the direction of comparison judging, or in somewhat drastic revision of the number of points to be cut, and consequent general lowering of the scores, it is at present impossible to say.

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[*] It is probable that an equal number of pens could be scored almost as quickly as they could be judged by comparison. But in the latter system the judge does not waste time over all the birds alike, whereas at score-card shows every pen is expected to be scored.

It will be found, in fact, by anyone who will take the trouble to work the problem out between three or four of the best pens in a good class, that such small cuts as are usual in America entirely upset the *proportionate* value of sections as laid down in a standard. Any point that is given great weight in the table of points, such as perhaps 25 points, has not its proper value in the judging unless, for serious fault, really heavy cuts are made in it. A curious proof of the small degree in which many American breeders and judges have realised this is the fact that Mr. I. K. Felch publishes a "decimal" score card of his own, and urges it on all possible occasions for universal use. In this, every variety of every breed is divided into ten sections, each valued ten points. Several authorities have commented on the proposal to give the same part equal weight in all breeds, which every breeder knows is not so in fact; but the curious thing is, that it never seems to have occurred to either those who attacked this card, or to the patentee himself, that such a decimal set of points, honestly applied, would *radically alter the judging* from what it is under points widely different in proportion. It is assumed on all sides that the result in placing birds would be the same; and probably it would, in practice; but such a result would be due to the trifling, perfunctory, *unproportionate* character of cuts for defects as carried out hitherto in much of American scoring.

American Strictness.

Until the last few years, curiously enough, American judging differed from English on the side of strictness. In England, with some exceptions, as a broad rule the judge formerly went by the plumage seen, and took little or no account of what was beneath the surface. In America, just as here *now*, stress has always been laid upon the plumage being barred, or buff, or whatever it is, "down to the skin." At the great Chicago show of 1899 there was shown a beautiful White Plymouth Rock pullet, by common consent the best in the class, and by many thought the best ever seen up to that time. After she had "scored" out, well on top, the judge happened to pass his hand through the plumage, and found *one feather* near the root of the tail, with a bar across it halfway down—a sign of the barred descent. It did not show in the least, and there was but this one speck all over her. But the standard gives amongst its general disqualifications, "in all white varieties *any feather* on a specimen having positive black or red in any part of the plumage," and the judge disqualified her. Some upheld him, other protested; the veteran Mr. I. K. Felch said if he had been the judge he would have pulled that feather out and said nothing; then many of course sat upon *him* for that. An English judge in those days would have ignored such a feather, unless he too had gone over to the Felch view. Sound undercolour, however, is a necessity in the light of present day judging, and a bird without it stands little chance of success in the show pen with any competent judge.

It is admitted by all, now, that a recognised standard is both necessary and of the highest use. To begin with, it *defines* a variety beyond dispute. A judge by the comparison system often meets cases of real difficulty—much more often now than formerly; and in such cases the actual addition of points will guide him to a sound decision. Study of it will train a judge, and teach him to seek and to find *reasons* for preferring one bird to another. It will show an experienced breeder about his fair chance of winning. It is a canon to which criticism may appeal in case of any marked error in judging. On the whole, without attempting prophecy, we are inclined to think that probably the standard may be given in the future a more prominent position in England, and a less so in America, than in the past.

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* One poultry periodical remarked (September, 1900), "The [illegible] and 96-point birds have been numerous, but we believe that fanciers now realise the fallacy of these inflated scores." Another, the most thorough-going of all in advocacy of the score card, writes, "No doubt we have in this country many birds scored too high; some of our best breeders say that all our birds are scored too [illegible]."

Method of Applying the Standard.

Supposing that the standard is actually used in judging—and as above indicated, even with comparison judging, or in criticism, individual cases often occur where it is very desirable to do this—a few words upon that use may be of service, the fruit of long and frequent experience. The American system of scoring all down one card, finishing one bird before going on to the next, is bad, and will be found worse when any correct proportion of cutting for defects is adopted. The judge in this way often cuts the same point more severely in one specimen, than for the same degree of defect in another. This is perhaps the most frequent cause of evident failures; the eye to some extent *forgets* its judgment in a former case, perhaps a dozen pens back. In all the pens which compete closely, the same points—as, for instance, head and comb taken together—should be scored or cut by themselves alone, through the entire number. In this way only, real comparison can be made, and each point should get fairly dealt with. Not till all have thus been gone through, one point at a time, should the totals be added. Then finally—and we lay special stress upon this—it should be noticed whether the birds as thus placed *seem to satisfy* the eye and general judgment. If they do, there is an end. But if not, further scrutiny should be made, to see if some tangible reason cannot be found for this; it may be found that there is error in the comparison of some point, or some point has been overlooked, or some evident defect may have been overlooked by the standard itself, and requires noting for the future. Care is needed that no personal partiality comes into play; but in direct opposition to some American advice, we strongly insist that no apparently unsatisfactory result *ought to pass unquestioned.* It does not prove the apparently wrong bird really the better, as seems assumed by American advocates of the score card "pure and simple"; no real breeder on the spot would agree to that at all. There is some reason for it, which ought to be looked into, and accounted for or else corrected. Our experience is that it generally can be, provided the scale of points itself be sound, though there are cases, as already indicated, in which harmony can only be arrived at by increasing the total possible cuts to over a hundred, an expedient, it will be seen, the exact reverse of the present American method of making trivial cuts for defects of a serious character.

The figures given in the new English standard are intended to represent the cuts which should be made for defects as great as can exist, to still leave a bird a chance of winning. Of course a defect might easily be so great as to leave a bird quite out of consideration. Taking as an instance comb, if that is so bad that no judge could award a prize, merely to deduct five points would not ensure correct judging; the bird would be ruled out, and no question occur. The five points (in a scale giving that number) are for the worst degree that may allow a win; while one point or even half a point will be allowed for slight defect, and so in proportion. The very intention is to give the judge more latitude than such rigid detailed small cuts mentioned above as laid down in America, and that for serious defects really serious deduction should be made.

Faking and Trimming.

One more feature of many shows, and one of the most troublesome and responsible duties of a judge in connection with his work, must receive some notice before closing this chapter. We refer to the artificial trimming or faking of show specimens, which demands constant watchfulness, and when detected should always receive, what unfortunately it does not in some cases, immediate retribution. For various reasons—mostly notoriety, perhaps—a great deal of folly has been written about this subject from time to time, calculated to give a false impression about the actual state of things. Every two or three years some exhibitor or judge writes a series of frothy letters declaiming against the iniquities practised, and prophesying that "unless something is done" the fancy must come to an end, that "all honest men will go out of it," etc. Usually the exhibitor is one less successful than others, and the letters imply that his ill success is mainly due to the iniquity of competitors; or the judge is one new to the ranks, and obviously desirous of establishing by a short cut a first-class reputation for honesty. However this may be, very little ultimately comes of it, and the discussion dies down with wearisome monotony, the real check to these practices lying all the while ready to hand.

The evil has always existed; for its springs lie deep in human nature, and not altogether amongst the baser motives. But it has not the magnitude which these interested correspondents usually represent; and it is also greatly kept in check by the public criticism, which in fact chiefly brings its developments to light. That many birds win which ought not to win, because their faults are removed by faking, and that some of these cases are practically impossible of detection, is true. That the majority of winners are so faked, or that faking has produced any *standard* of perfection which would not have existed otherwise, or which the honest breeder cannot breed up to, is not true; and winners are honest in the majority of cases, in the majority of classes; one or two exceptions there certainly are. It is also the fact that the worst cases are generally brought to light sooner or later, and that there now exists recognised machinery for dealing with them, which is able to exert more and more steady pressure in that direction. While there is probably more skill in faking to-day than ever, the state of things on the whole is certainly better and not worse than formerly, owing to the circumstances above indicated.

Agitation against Trimming.

There was a time, years ago, when energetic agitation was required, and about the year 1870 we organised and obtained numerous signatures to a written protest against the then tacit toleration of these practices, which was printed and sent to the executives of the principal shows. This had some perceptible effect, chiefly in the wide adoption of our proposed rule, to the effect that at the show adopting the rule all cases detected by the judges would be marked "Disqualified," and the prizes, if any, withheld. That was something, but it did not prove nearly enough; for it was found over and over again, that even when the judges had done their duty, committees would not do theirs. At the then principal English show of the year, Messrs. Hewitt and Teebay had their attention specially drawn to this rule. As stated by Mr. Hewitt himself in the *Illustrated Book of Poultry*, they found it necessary to disqualify nearly one-third of the class of Dark Brahma pullets for gross plucking of vulture-hocks, and reported accordingly. The committee would, however, do nothing, and when remonstrated with replied, as Mr. Hewitt stated, that they had declined to record the penalty in any way, "as it might injure future shows." We remonstrated personally in the very same case, and were told that "as the guilty parties had taken no prizes with the trimmed birds, no harm had been done," so low was the general tone of feeling at that time. Such is obviously not true; for whereas, if punished, a faker may be deterred from trying again, and is at least debarred from immediately selling his faked stock, while the public are warned of him, impunity even if unsuccessful emboldens him to renew the attempt elsewhere. However, it became necessary to set on foot yet another press campaign for the "Suppression of Fraud," the object of which was to provide some *machinery* for action. This was steadily maintained, the chief burden falling upon us for a year or two, until at length the personal exertions of the late Mr. Alexander Comyns, aided by a few leading exhibitors who collected around him, especially the late Mr. O. E. Cresswell, resulted in the establishment of the Poultry Club, which made the systematic suppression of fraud one of its cardinal objects.

Poultry Club and Suppression of Fraud.

For some time the progress of this body was slow, and lack of power compelled it to be cautious; but as it gradually grew in membership and influence (numbering now over a thousand) it became better able to carry out its consistent policy of inducing committees, by more or less of its support, to hold their shows under its rules. The number of shows so held is now very great, and the influence thus exerted has compelled even the few larger shows which refuse formal adherence, to adopt as their own rules very similar in form and object to the Poultry Club's rules. These provide that no person under present disqualification by the club shall be allowed either to judge or exhibit at the show; that no exhibitors or their servants may pen their own birds, or be admitted before the public; that entries may be returned or refused (which is chiefly enforced to prevent disqualified persons from exhibiting under false or altered names); that no exhibitor shall act as judge; that the judges shall disqualify for any detected fraudulent treatment, or for being over the proper age; that anyone *may lodge a protest* against an exhibit with a fee of £1 1s., which shall be, however, only retained if it is held that the protest was without reasonable ground; and the case protested shall be carefully examined, and if necessary be disqualified; that any exhibitor disqualified for fraud, either by the original judge or upon protest, shall forfeit *all other* prizes won at the show as well, and may be either temporarily or permanently *prohibited from exhibiting at all shows held under Poultry Club rules;* that any so disqualified pens shall be detained by the show committee for three days after the close, within which time the exhibitor, who is notified of the penalty, may appeal to the council of the Club, in which case the exhibit is sent direct to the Club offices, and the case again examined and finally determined. At many shows thus held under its rules an accredited representative of the Club, wearing a badge, attends to direct any necessary proceedings; and cases brought before it are also reported amongst the council's proceedings in the poultry press.

Such is the machinery actually in existence in England at the present time for the suppression of fraud. And it is anything but a dead letter. Month after month cases are reported of exhibitors being suspended from exhibiting at shows held under Poultry Club rules (a large number now) for periods of one to three years, and several unusually gross cases have been disqualified for life. We specially recollect one remarkable case in which a very prominent Cochin exhibitor of that particular time—a woman, by the way—was disqualified permanently for her birds being "fluffed" in the manner presently described, with suspicion of other matters. Her Cochins were then shown by a female relative, who was also shortly disqualified; and finally a third family connection earned the same distinction. It took time; but the whole guilty circle were ultimately, to all intents, driven out of exhibition. Many exhibitors seem still unaware of the completeness and efficiency of this machinery, and we trust that the short statement here given may spread the knowledge of it, and increase its efficiency still more. For honest exhibitors should *do their part* by entering "protest" against obvious fraud, and by the vigilant use of the keen eyes with which Nature has endowed them. During the few most recent years, happily, they have done so more and more, and this has partly led to the idea that such practices are increasing; whereas it is quite the other way so far as the best shows are concerned.

Effects of Poultry Club's Legislation.

That a great deal of fraud still goes on, at more out of the way shows especially, is true enough; and whereas formerly, as we have seen, when the judges had done their duty committees often deliberately refused to do theirs, we regret to say that much of the blame now rests with the judges at such shows. That there is a class of these who "work in" with exhibitors, and who judge many shows gratis because they have other ways of making money by it, is true beyond doubt, though difficult of proof. Men of this stamp wink at frauds they see plainly enough; and give prizes to birds which they know are fraudulently dealt with. The fact is that there is much which really cannot be detected, or pronounced actual fraud with certainty; and some judges take shelter under that. The danger is real, and it is better for three guilty ones to escape for a doubt, than for one innocent one to be falsely condemned. There are those who have suggested that since the card "Disqualified," though in itself most proper as a mere statement of fact, has come by usage to be regarded as a charge of fraud, another card should be introduced, simply denoting that a bird was "passed" for some alleged reason stated. Thus, supposing a Partridge Cochin cock which apparently is otherwise in full feather, has scarcely any tail. It *may* be that the tail really has not grown yet—we have known such cases; or it *may* be that there was much white in it, and it was plucked. No one can absolutely prove which it is; but the card would simply denote that the bird was "passed" for deficient tail, for the matter of fact which all could see for themselves. The exhibitor would have no direct charge made against him, and could not complain, since it may be very strongly held that no one has a right to win with a bird that *really looks suspicious* in regard to honesty, however honest the exhibitor may privately know it to be. The same holds good about ages; a pullet may have moulted out a second time, so as to look like a hen. The exhibitor may know that she is a pullet; but for a bird to win in such a class that looks in every point a hen is unfair, because it places the judge, and the show, and every other exhibitor, in a false position. Thus even mere appearances have much to do with right in such matters, and we point this out because it does not seem to be recognised as it should. If the introduction of such a card would really induce judges generally to mark suspicious pens, and refuse prizes for the reason stated, their use would be valuable; and we repeat distinctly that, whatever it may be in the knowledge of the owner, a bird that *does not look honest* should not be exhibited, and if it is, should not be awarded any mention beyond that of a "Passed" card.

"Passed" Cards.

The upright judge must therefore be constantly on the watch against attempts at deceiving him by artificial faking. All he cannot detect, and he is not called upon to go ruffling through the plumage of all the birds to see what he can find. That would seriously damage the birds themselves, besides the question of time. And a good judge may, especially at first, be too "innocent" to discover what others can find. A case occurs to us as we write these lines, wherein a judge who had disqualified one or two faked combs, and presumably "meant business," passed without discovery three Buff Orpingtons which were most beautifully dyed! It is easy to scoff at such an oversight; but the judge might very well reply that he was not "up" yet to all the tricks of the Buff Orpington men, and could only learn them by degrees. He can but do his best, and bring an open mind to any evidence subsequently placed before him. It not unfrequently happens that some gross case of fraud gets "blown upon" by some private informer; and though the motive for this is far more usually malice than honesty, the public benefits all the same. On the whole, we repeat that things are improving, not deteriorating; that there is adequate machinery, which only needs to be more freely used; and that the proper direction for effort is towards the more free use of that machinery, and greater public vigilance, not strong language, however fine and large.

Need of Moderation.

Reasonable moderation must be also borne in mind. We have already hinted that some trimming was not done *altogether* from the baser motives. We knew a man who never exhibited, though he sold winners largely to those who did, yet who always removed single foul feathers. The reason he gave was that he "could not bear to see them." There are many who have that instinctive fancier's feeling very strongly, whether or not they act upon it; we once read in a New England journal, "It is impossible not to draw a little hard upon a feather, when you know that but for that one your bird would be a perfect beauty." Whoever does not understand that feeling, has never been a true fancier; hence it is, also, that the best fanciers generally feel a little gentle tolerance for that kind of thing; the fancier's *passion for perfection* in appearance, they know, is partly at the root of it. While no club, or standard, or code of morals can draw any line or make any distinctions—for if even one feather *may* be removed, surely a second may, and a third, and so on—all the same this minor degree of trimming has palliations, and stands on a different practical level from much else; the White Rock we wrote of above, was just as good and valuable a bird with that one feather in, as with it out. However, it is needless to discuss this question beyond pointing out that there *is* some distinction; because the abstraction of such rare and stray feathers, of any kind, unless cardinal or key feathers in wings or tail, cannot possibly be detected even by the closest scrutiny, and the propriety of removing any broken or bent small body feather which merely mars the smooth outline, has always been generally acknowledged. It may, however, be useful to indicate the chief kinds of more serious fraud, capable of detection, which have been at one time or another recorded.

Trimming Combs.

Symmetrical and neat comb is a very important point in many breeds; and when a bird is good otherwise but defective here, the knife or dissecting scissors are often employed to cut it into better shape. Side sprigs on single combs are frequently removed by a razor, and we have often seen signs in Minorcas that small or ugly spikes or serrations have been cut into better ones. But it is in Hamburghs that operations on combs have been most general, the ends of the little projections being sliced to an even plane, and more extensive cutting off of entire portions practised, in ways that had better not be definitely indicated. We will only say that we have *known* (for it is remarkable that, being known never to break individual confidence, we have been oftentimes given information freely on these points, and even shown them) several cases in which a large piece of wedge shape has been cut out of the centre of a Hamburgh comb, which was then sewn up so as to draw together and make the whole much smaller; and we once heard of a horrid case—to this day we hardly know whether to believe it or not—in which one otherwise inferior bird having an exquisite comb, while the show bird had a coarse one, both were amputated by a horizontal cut, and the two being at once transposed, were sutured and reunited. Several cases have actually occurred, and been recorded in print, of the judges finding Hamburghs in the pens with long pins or needles through the combs, in order to hold parts in better position, or which may have been inserted to hold cut portions together, and been forgotten. It is needless to declaim about the unbridled rivalry and greed which could perpetrate a cruelty that is nauseating; unfortunately, Hamburghs are more often victims to it than any other breed. We can only state here that when a comb is cut, the place of the scar covers over with *smooth* skin, slightly glossy, and this is the chief sign of the operation. If such a case is challenged, the exhibitor usually says that the bird has torn his head in fighting, or wire netting, or something of that sort. But a bird with such signs in suspicious places ought certainly to be refused a prize, even if want of absolute demonstration prevents the judge from going farther.

Dyeing of Plumage.

Dyed plumage is not so very uncommon, the usual colours being black or buff; the great boom in buff breeds produced at least half a dozen convicted cases in England in twelve months. Tail feathers which should be black, but have much white in them, are sometimes stained with nitrate of silver, and there was at least one case in which too much white in the foot-feather of a Dark Brahma was treated in the same way. A chemical test is unnecessary here. A tail often passes unnoticed, for, as already said, judges cannot possibly go overhauling all the plumage of the birds; but if anything does excite suspicion—as if a bird previously shown with the white, again turns up apparently orthodox—mere close inspection will show that all the supposed black is not alike. Buff dyeing has been so far chiefly found in Leghorns and Buff Orpingtons, and has usually been done by washing in Maypole soap, or some other form of what is really aniline dye. What a lady would term a "really lovely" buff should excite suspicion; but a chemical test is of course the criterion. Much harm was done at one time by a school of amateur detectives, who professed to test buff dye by solutions of caustic potass; and years ago we remember the late Mr. Blakston disqualifying a canary on that account with the deepest pain and regret, the owner being a man whom he had always believed honest as the day; but the colour came off, rich and undeniable, in the fluid, and he deemed that there was no escape. It is now known, and the reader may prove for himself, that an *honest feather* also dissolves and produces coloured solution just the same, and we fear that in Mr. Blakston's case the poor canary exhibitor was an innocent victim. We have known an exhibitor take a rival's Buff Leghorn out of the pen, and apply this "test," not even to a pulled feather, but to the plumage on the bird, with the result that the feathers touched were really dyed much darker, as shown to us by the victim at the London Dairy Show of 1899. We cannot put it too strongly, that potass solution dissolves out colour from honest plumage, and is no test for aniline dye.

There is fortunately a real test, however, as published by Dr. Mossop in *Poultry*. Test-tubes should be provided, about six inches long and three-quarter inch bore, and if possible a genuine feather tested in another tube, along with the suspected one—for only plucked single feathers ought ever to be tested; no one has a right to risk disfiguring the bird itself. The feather should be pushed down to the bottom of the tube, strong hydrochloric acid poured in a half inch or more deep, and the tube a little shaken about (without spilling the strong acid) so that the feather, at first greasy, may become wetted by the acid. A feather dyed buff with Maypole soap or aniline dye will quickly turn a beautiful violet colour; the genuine feather is unchanged beyond the darkening from being wetted. Dr. Mossop found one or two dyes that resisted this test, but these responded in another way, by losing all the dyed colour to a solution of crystals of protochloride of tin dissolved to saturation in hydrochloric acid diluted with its own bulk of water. This solution spoils by keeping, and should therefore be freshly made, dissolving a few crystals when wanted in the diluted acid. Sometimes a feather that seems to resist will bleach out the dye if the test tube containing the tin chloride is warmed over a spirit lamp. If no decided bleaching takes place then, and the feather has not been turned violet by the acid either, the plumage is probably honest, and at least no ordinary dye has been used.

The shanks are sometimes coloured, either for yellow, or willow, or black. A handkerchief or clean white rag, successively applied with water, methylated spirit, and benzol, will usually detect either of these, if appearances seem suspicious.

Plucking.

Plucking is the most frequent kind of fraud. As already indicated, it may be of a very mild and comparatively innocent character; but as such cases could not possibly be detected even if suspected, or even if known, such cause no questions. Tail feathers are mostly plucked for white or black in them where it should not be, or wing feathers because twisted or out of place; counting will reveal these, if suspicion be aroused. If the whole tail be absent, or apparently far too short, the judge will act according to his view of the case, since at some periods it might be natural enough, as in an adult cock early in November. The most difficult cases are perhaps those of wholesale plucking of body feathers, which is too usual in some laced and spangled breeds, especially silver spangled Hamburghs. Here also a fair number of single feathers might obviously come out without detection, but we have seen a bird so plucked that bare patches of skin were exposed even on the feather tracks.* Instances not so extreme as this give most difficulty; but so peculiar is this special case of Hamburghs that we have sometimes thought it might be better if Hamburgh trimming were legitimatised, as in trimming Spanish faces. The simple fact is that the "largest" spangles are desired by some breeders, and they have been bred so large that a pullet with all the feathers left in would show no spangling at all, but her breast especially would appear almost black. Enough feathers are therefore plucked to show the spangling separated, and a good Mooney will sometimes lose half a basketful. Birds can only be shown naturally in this breed, either by breeding spangles rather smaller, or allowing them to appear almost entirely black in the pen, which hides their marking and prevents their winning. Hamburgh men are a peculiar set, who have kept much to themselves for pretty nearly half a century, if not more, and it is quite certain that every good pullet or hen with spangles of the largest size *is* plucked more or less before she can show her pattern. Anyone can see for himself, in some other breed, how much of any single breast feather is naturally exposed, and that this is not enough to show separately a large Mooney spangle, and there we must leave this particular matter.

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* Some writers seem to suppose that the feathers grow equally all over. That is not so; they grow or are arranged in certain bands or tracks, which differ in different genera of birds.

Vulture hocks were largely plucked at one time, but their admission in England has put a stop to that for many years. It is easily detected by passing the hand up against the feathers; if the remainder are felt too stiff and jagged, close inspection will reveal the plucking, either by the holes or the young shoots of new quills.

False Sickles.

The greatest triumphs of the faker are perhaps the insertion of perfect feathers instead of imperfect, especially in regard to the sickles of Hamburghs and Bantams. There have been men who always treasured an unusually fine pair of sickles for further use, and even now it is done occasionally. The natural quill is cut off about an inch long, and cleared out, the perfect plume being then inserted in the stump as in a socket. In one case the pair were found fastened in with cobbler's wax; in another the two were bound round with thread. The more usual plan now is to either fasten the feather in with some transparent cement, or use extremely fine waxed silk with an "imping" needle. This fraud can always be seen on blowing into the roots of the tail, to expose them to view; but a judge cannot be always putting birds under the microscope, as it were, because fraud is perpetrated occasionally. The best ground of suspicion is, perhaps, if a bird exhibiting much gloss generally, appears in the sickles a little dull or faded in comparison. In that case an examination should certainly be made, in all breeds wherein sickles are a leading point.

Fluffing.

The chief other practice which has come under our own notice we may perhaps term "fluffing," or adding to the fluffy appearance of Asiatics. In Cochins especially, great globular masses of soft plumage are highly valued. In a case already alluded to, wherein the Poultry Club had been successful in excluding successively three representatives of one family and of the same yard, amongst other frauds this one was very prominent. In several well-known birds, when carefully examined, it was found that over large regions of the body the buff plumage had been gone over, feather by feather almost, each being bent back by thumb and finger, or perhaps forceps, and then re-bent in the opposite direction rather higher up, so as to stand out from the body more than naturally, and thus deepen the fluffy mass. It was calculated that one disqualified fowl must have occupied many hours in this treatment. Here, again, the fraud was plain enough when *suspicion* was aroused; and the lack of suspicion is the chief reason why such things may go on unpunished for a while, though Nemesis generally comes at last. A minor form of fluffing we would hesitate to call downright fraud, but certainly it is highly objectionable. After washing a Cochin or Light Brahma, it is very easy so to keep working the fluff of the thighs outwards whilst drying, as to make it protrude much more, loose and flossy, instead of lying down naturally. We often see birds so, and much dislike it; and as this is obvious to the naked eye, we think judges should deduct points for it, rather than allow anything for the supposed fuller fluff of the birds.

Duty of the Public.

It will be seen that both the judges and committee of a poultry show have very serious responsibility, and that the judges' task, in particular, is no easy one at best. Whatever can lighten it should be most sedulously studied. The press also has its heavy responsibilities, and is waking up more and more to these every day; some of its representatives rank as authorities with the best judges in the land. But when all these duties have been discharged, more or less perfectly as the case permits, the exhibiting public still has *its* share of responsibility also. It is not only responsible for using upon occasion the machinery ready to hand for the suppression of real fraud, but for keeping up a *tone* in the fancy adverse to it, and in favour of such effective proceedings. For many years this was much lacking. In our own earlier battles with fraud, our experience too often was that after taking up some flagrant case upon distinct promise of the necessary personal evidence, this was ultimately refused for cowardly or interested reasons, and we were left to face the issue unaided by those who alone could ensure full success, and at whose own urgent entreaty we had moved in the matter. It does not lie with people like this to rail at judges, or exhibitors, or committees, or the press. The state of things is neither so good as one could wish, nor nearly so bad as it is often painted; but such as it may be depends far more upon the great mass of exhibitors than upon anything else. There are exhibitors and judges both, well known or who can be known, with whom it is no credit to be on particularly intimate terms; there are many shows, ascertainable by inquiry, which the genuine amateur should refuse to support by his entries. Mere declamation is of no use; it is the quiet performance of one's own duty as it comes in one's way, on the side of justice, that is required; and to have largely modified public feeling in this direction is not the least of the good work which the press and the Poultry Club have effected during recent years.

Before passing to detailed treatment of various breeds, it will be convenient to present a glossary of the technical terms constantly employed by fanciers and breeders, with a diagram to assist in their definition.

Barred, *Barring*.—Alternate stripes of light and dark across a feather.

Bean.—A bean-like patch on the extreme tip of the upper mandible of some varieties of ducks and geese.

Beard.—A bunch of feathers under the throat of some breeds, as Houdans or Polish.

Blocky.—A word used to describe a thick-set, squarely built bird with legs placed wide apart.

Brassy.—A term used to indicate that the plumage of a barred Plymouth Rock has become discoloured, or burnished, owing to exposure to weather or sun.

Breast.—In a live fowl, the front of the body above the point of the breast-bone up to the throat. (No. 6.) In a table fowl (dead) the breast is below this, and would be called the under part of the body in the live bird.

Breed.—Any variety of fowl in all its distinct characteristics. The *breed* includes all the *varieties* of colour which are found in it.

Brood.—The family of chickens under one hen or brooder.

Broody.—Desiring to sit or incubate.

Cape.—The feathers under base of the back hackles, between the shoulders.

Carriage.—The bearing, attitude, or "style" of a bird.

Caruncles.—Fleshy protuberances, as on the neck of a turkey-cock.

Chick.—A newly hatched fowl. Used only till a few weeks old.

Chicken.—This word is often applied to any age indefinitely until twelve months old.

Cockerel.—A young cock.

Comb.—The red protuberance on the top of a fowl's head. (No. 1, Fig. 84.)

Condition.—The state of the fowl as regards health and beauty of plumage—the latter especially.

Crest.—A crown or tuft of feathers on the head. The same as Top-knot.

Crop.—The bag or receptacle in which food is stored before digestion. Can be easily felt in any fowl after feeding.

Cushion.—The mass of feathers over the tail-end of a hen's back, covering the tail; chiefly developed in Cochins.

Deaf-ears.—Same as Ear-lobes. (No. 4.)

Diamond.—A term sometimes applied by Game breeders to the wing-bay. (No. 15.)

Dubbing.—Cutting off the comb, wattles, etc., so as to leave the head smooth and clean.

Duck-footed.—Having duck-like feet, *i.e.*, a fowl with the hind toe placed close to the inner side of the foot instead of being in a line with the middle toe, and pointing straight behind. The term is generally used in connection with game fowls.

Ear-lobes.—The folds of skin hanging below the ears. They vary in colour in different breeds, between red, white, blue, and cream, and also greatly in size. (No. 4.)

Face.—The bare skin round the eye. (No. 2.)

Flights.—The primary feathers of the wing, used in flying, but tucked under the wing out of sight when at rest. (No. 17.)

Fluff.—Soft downy feathers about the thighs, chiefly developed in Asiatics; also the downy part of the feather.

Foxy.—Birds of the black-red varieties, particularly brown Leghorn hens, are said to be "foxy" when the wing colour is very dark red, and which looks "hard" when compared with the softer body colour.

Furnished.—Assumed the full characters. When a cockerel has obtained his full tail, comb, hackles, etc., as if adult, he is said to be "furnished."

Gills.—This term is often applied to the wattles, and sometimes more indefinitely to the whole region of the throat.

Gipsy-faced.—A fowl is so designated when the skin of its face is of a dark purple or mulberry colour; or when it is covered with short hair-like feathers.

Hackles.—The peculiar narrow feathers on the neck of fowls, also found in the saddle of the cock. In the latter case they are called "saddle" hackles or feathers; hackles alone always referring to the neck-feathers. (No. 5.)

Hen-feathered, or Henny.—Resembling a hen in the absence of sickles or hackle-feathers, and in plumage generally.

Hock.—The joint between the thigh and the shank. (No. 19.)

Keel.—The vertical part of the breast-bone. Also applied to dependent flesh and skin below the latter, as in many ducks.

Knock-kneed.—The hocks standing near together, instead of well apart.

Laced, *Lacing*.—A stripe or edging all round a feather, of some colour different from its ground colour, as in Sebrights and Wyandottes.

Leader.—A single spike terminating the "rose" type of comb, as in Hamburghs, Wyandottes and Rosecomb Bantams, etc.

Leg.—In a live fowl this is the scaly part, or shank. In a bird dressed for table, on the contrary, the term refers, as is well known, to the joints above.

Leg-feathers.—The feathers projecting from the outer side of the shanks in some breeds, as Cochins.

Mealiness.—Used to denote defective buff colour, when the plumage, instead of being one level tone, is spotted with white.

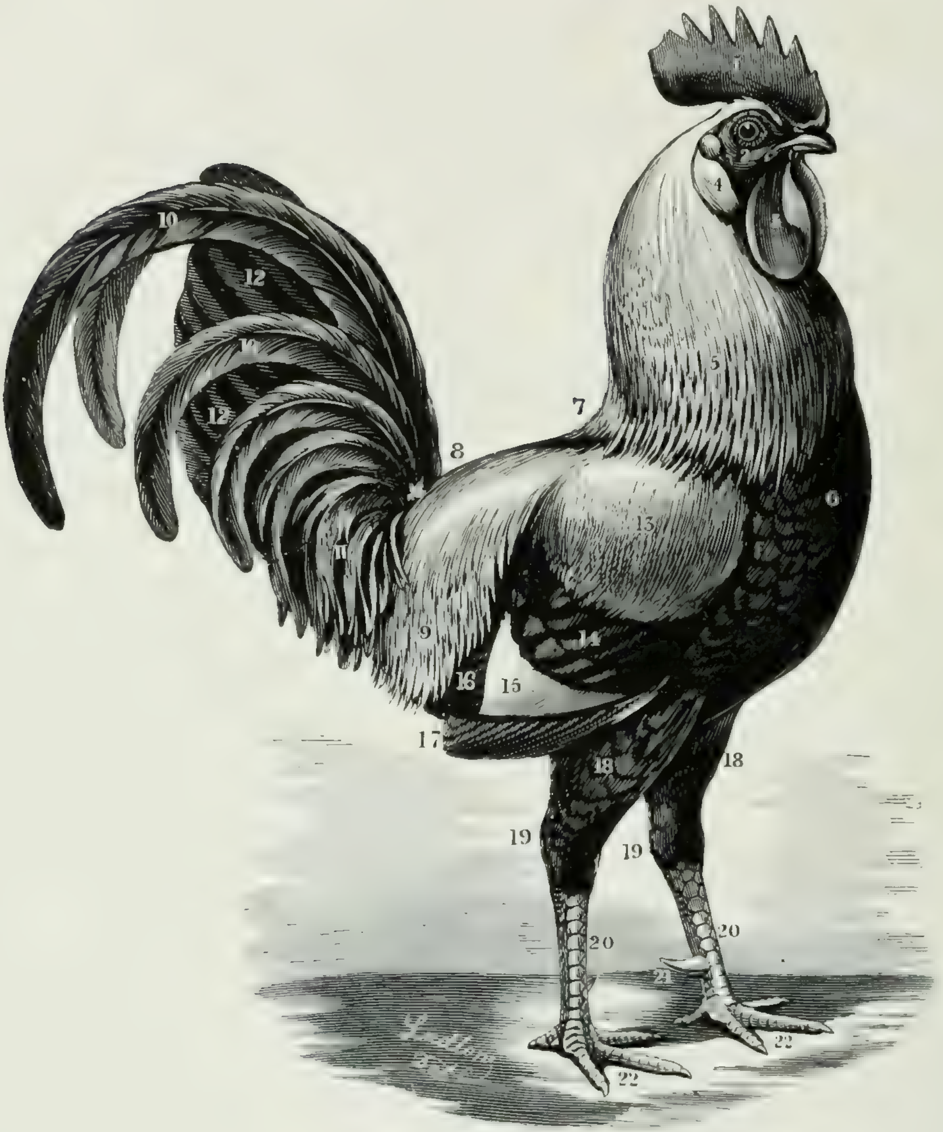
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Fig. 84.—Points of a Fowl.

REFERENCES.

1. Comb.
2. Face.
3. Wattles.
4. Deaf-ear or Ear-lobe.
5. Hackle.
6. Breast.
7. Back.
8. Saddle.
9. Saddle-hackles.
10. Sickles.
11. Tail-coverts.
12. True Tail-feathers.
13. Wing-bow.
14. Wing-coverts, forming the "bar."
15. Secondaries, the lower-ends forming the wing or lower butts. Wing-bay. Diamond.
16. Lower wing butts.
17. Primaries. Hidden by Secondaries when the wing is closed.
18. Thighs.
19. Hocks.
20. Legs or Shanks.
21. Spur.
22. Toes or Claws.

Mossy.—Confused or indistinct in marking.

Pea-comb.—A triple comb, resembling three small combs in one, the middle being the highest.

Pencilling.—Small markings or stripes over a feather, either straight across, as in Hamburghs, or in crescentic form, as in Partridge Cochins.

Poult.—A young turkey.

Primaries.—The flight-feathers of the wings, hidden when the wing is closed, being tucked under the visible wing composed of the "secondary" feathers. Usually the primaries contain the deepest colour all over the body, except the tail, and great importance is attached to their colour by breeders. (No. 17.)

Pullet.—A young hen. Some think the term is not properly applicable after December 31 of the year in which a bird is hatched; others that it is so up to one year old.

Reachy.—A term applied to Modern Game fowls (in which "reachiness" is an important point in a show bird) to denote that they stand erect.

Roach-back.—A convex-shape of back, and a great fault in all fowls, with the exception of Malays.

Rooster.—An American term for a cock.

Rose-comb.—A broad solid comb, the top of which is nearly level and covered with small points. It becomes broader as it recedes from the front, ending with a spike or "leader" at the back.

Saddle.—The posterior part of the back, reaching to the tail, in a cock, answering to the cushion in a hen. (No. 8.)

Sappiness.—A bird is said to be "sappy" when the "sap" in the feather is perceptible on the surface of the plumage. It shows in a white fowl in the form of a yellow or light primrose tint.

Secondaries.—The quill-feathers of the wing which are visible when the bird is at rest. (No. 15.)

Self-colour.—A uniform tint over feather or bird.

Shaft.—The stem or quill of a feather.

Shank.—The scaly part of the leg. (No. 20.)

Sheen.—Another term for "lustre." The word is used to denote that a black Orpington, Langshan, Hamburgh and the like, of beetle-green plumage, is of a rich and transparent colour.

Sickles.—The top curved feathers of a cock's tail. Properly only applied to the top pair, but sometimes used for one or two pairs below which can hardly be called tail-coverts. (No. 10.)

Spangling.—The marking produced by each feather having one large spot or splash of some colour different from the ground-colour. When applied to a laced breed, as in Polish, explained by the much broader lacing at the tip of each feather.

Spur.—The sharp weapon near the heel. (No. 21.)

Squirrel-tailed.—The tail projecting in front of a perpendicular line, over the back.

Stag.—Another term for a young cock, chiefly used by Game breeders.

Station.—Another term for symmetry, but rather markedly in connection with height or reach.

Strain.—A race of fowls which, having been carefully bred by one breeder or his successors for years, has acquired an individual character of its own which can be more or less relied upon.

Symmetry.—Perfection of proportion.

Tail-coverts.—The soft, glossy, curved feathers at the sides of the bottom of the tail. Usually the same colour as the sickles. (No. 11.)

Tail-feathers.—The straight and stiff feathers of the tail only. The top pair are sometimes slightly curved, but they are always nearly if not quite straight, and are contained *inside* the sickles and tail-coverts. (No. 12.)

Thighs.—The joint above the shanks; the first joint clothed all over with feathers. The same as the drumstick in dressed fowls. (No. 18.)

Thumb-marked.—A term used in connection with single-combed male fowls, such as Minorcas and Leghorns, to describe a comb that is indented or hollow on one side and protrudes on the other, as if a thumb had made the depression.

Top-knot.—Same as Crest.

Tri-coloured.—A term often applied to cockerels which should be of one uniform colour, when their hackles and saddles and tails are much darker, and the wing-bow darker still. Chiefly in buff varieties.

Trio.—A cock or cockerel, and two hens or pullets.

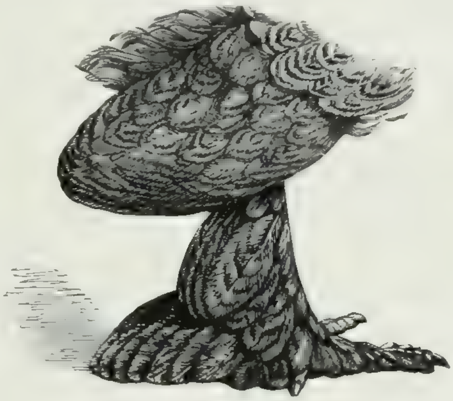

Fig. 85.—Vulture Hock.

Under-colour.—That portion of the feathers under the surface, only seen when the plumage is opened or separated. That of the fluff of the feather. It often differs greatly from the surface-colour, and is of great importance in breeding.

Variety.—Some definite division of a breed known by its colour or marking. Thus the *breed* includes all the *varieties.*

Vulture-hock.—Stiff projecting quill-feathers at the hock-joint. The feathers must be both stiff and projecting to be thus truly called and condemned. (Fig. 85, leg of Brahma pullet.)

Wattles.—The red depending structures at each side of base of beak. Largest in male. (No. 3.)

Web.—This term is indefinite, expressing a flat and thin structure. The web of a feather is the flat or plume portion; the web of the foot, the flat skin between the toes; of the wing, the triangular skin seen when the member is extended.

Wing-bar.—Any line of dark colour across the middle of the wing, caused by colour or marking of feathers known as lower wing-coverts. (No. 14.)

Wing-bay.—The triangular part of the folded wing between the wing-bar and the point. (No. 15.)

Wing-bow.—Upper or shoulder part of wing. (No. 13.)

Wing-butts.—The corners or ends of the wing. The upper ends are more properly called the shoulder-butts, and are thus termed by Game fanciers. The lower, similarly, are often called the lower-butts. (No. 16.)

Wing-coverts.—The broad feathers covering the roots of the secondary quills. (No. 14.)

CHAPTER XV.

COCHINS.

THOUGH less popular now than formerly, Cochins well deserve still to head the list of breeds in any book of poultry. Independent of their own merits, which have doubtless fallen into the background since the modern standard of breeding has impaired their utility as layers and table-fowls, they have been the chief progenitors of a whole family of poultry, justly valued for their useful qualities, and all alike founded on a Cochin cross. And apart from even that, their introduction was the most memorable event that has ever happened in the poultry world: there has been nothing like it before or since. Previously, very few people indeed except farmers kept fowls, and those only scrubs or mongrels; and one or two shows which made attempts to attract public interest, were only looked upon with a good-natured contempt. In 1850 Cochins were exhibited at Birmingham, and changed everything. Every visitor went home to tell of the new and wonderful fowls, which were as big as ostriches, and roared like lions, while gentle as lambs; which could be kept anywhere, even in a garret, and took to petting like tame cats. Others crowded in to see them, and the excitement grew, and even the street outside the show was crammed, and *Punch* drew and wrote about the new birds; and before people knew where they were, they were in the midst of the curious "poultry-mania" of the middle of the nineteenth century. That, in its acute stage, of course could not last; but the breeding and exhibition of poultry did, to such an extent that ever since there has never lacked a market for a really good bird. And the Cochin did it all. He is *the father of the poultry fancy*, and none may dispute his place of honour.

Origin of Cochins.

Books of much pretension have traced the origin of this breed to some fowls imported in 1843, which afterwards became the property of the late Queen Victoria, under the name of Cochin China fowls. As regards the fowls themselves this is a total mistake. A drawing was given in the *Illustrated London News* of that date, from which and the description it is manifest that they had absolutely no points of the Cochin at all, save perhaps yellow legs and large size. The shanks were long and bare, the heads carried back instead of forward, the tail large and carried high, the back long and sloping to the tail, the eyes black, the plumage close and hard. Of what we may call Malay blood they probably had a great deal; of Cochin blood none, or but some trace in a cross. But one thing about them there was: these fowls were not only big, but they probably did really come from Cochin China, and from them and that fact came undoubtedly the *name*, which will now belong, while poultry breeding lasts, to another fowl that has no right to it at all.

The real stock first reached this country in 1847, Mr. Moody, in Hampshire, and Mr. Alfred Sturgeon, of Gray's, Essex, both receiving stock in that year. Mr. Moody's, so far as we can learn, were inferior in character and leg-feather to Mr. Sturgeon's, but were very large and of the same broad type; and all alike came from the port of Shanghae or its neighbourhood. The birds were undoubtedly Shanghaes, and had never been near Cochin China; and for years attempts were made to put this matter straight. The first *Poultry Book* of Wingfield and Johnson (1853) wrote of them as Shanghaes, and all American writers strove for the same name years after the attempt had been abandoned in England; but it was no use. We never knew a case yet where facts struggled against a popular name, but the name won in the end, and so it was here. The public had got to know the new big fowls as Cochins, and would use no other word; and so the name stuck, in the teeth of the facts, and holds the field to this day.

Mr. Sturgeon's stock, with subsequent imports from Shanghae, has been the main source from which Cochins were bred in this country; America has had many independent importations. Mr. Punchard's stock was mainly from Mr. Sturgeon, the latter keeping from choice the lemons and buffs, while Mr. Punchard had the dark birds which originated the partridges, colour being very uncertain in the breeding of those days. The late Mr. Sturgeon gave, in 1853, this account of the origin of his stock:—

> The history of my Cochins is a very absurd tale, and full of ill-luck or, perhaps, carelessness—a term for which ill-luck is often substituted. I got them in 1847, from a ship in the West India Docks. A clerk we employed at that time happened to go on board, and, struck by the appearance of the birds, bought them on his own responsibility, and at what I, when I came to hear of it, denounced as a most extravagant price—some 6s. or 8s. each! Judge of my terror, after my extravagance, when I found a younger brother had, immediately on their arrival, killed two out of the five, leaving me a cockerel and two pullets; nor was my annoyance diminished on hearing him quietly remark that they were very young, fat, and heavy, and would never have got any better! The cock shortly after died, and beyond inquiring for another, which I succeeded in obtaining shortly after the original died, together with a number of hens, which reached this country under peculiar circumstances, I personally took but little interest in them till the eve before their departure for Birmingham in 1850. Neither my brother nor myself, before we obtained these birds, had taken very particular interest in poultry, and why we came to prefer the light-coloured birds still remains a mystery to me; but so it was, for to Mr. Punchard and to all others we parted with none but the smaller and darker-coloured birds. I have often laughed at the dreadful passes my now famous breed has been reduced to, and the very narrow escapes it has had of utter extinction—first the attack of my brother already narrated; then the death of the cock; and in the third year the desperate incursions of some mischievous greyhound puppies, who killed one morning five young birds just as they were getting feathered, besides many more on different occasions. Our birds all came from Shanghae, and were feather-legged. It is to the cock of our second lot that I attribute our great success. I have had fifty others since, in four or five lots, but not a bird worthy of comparison with my old ones, or that I would mix with them.

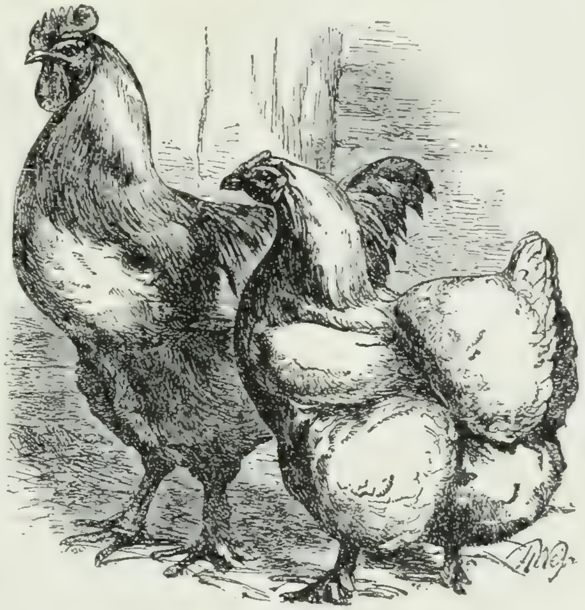

Fig. 86.—Cochins of 1853.

Mr. Sturgeon priced his first Cochins at Birmingham at £5 per bird, as a prohibitive price; but Mr. Punchard deemed that sum ridiculously extravagant, and entered his at £5 per pen of three. According to an account given by Mr. Sturgeon to Mr. Norris-Elye,* Mr. Punchard's pens were all claimed, and Mr. Sturgeon's would have been also, over and over again, but the would-be buyers waited in the supposition that he would take less, as Mr. Punchard's were so much lower in price. Mr. Sturgeon was thus enabled to claim the entire lot, and keep them in his own hands; and a year or two later, when he had a sale—the first poultry sale of the kind ever held—which was conducted by Mr. Henry Stafford, the late well-known Shorthorn auctioneer and the publisher of the *Shorthorn Herd-book*, his surplus stock of 120 birds realised a net total of £609.

The Cochins thus introduced into England were perceptibly different from the present type of bird, though exhibiting in the main the chief characteristics which distinguish them still in the broader features from other races of fowls. The accompanying illustration, which is reduced from a drawing by the late Mr. Harrison Weir in the *Illustrated London News* of 1853, will show the characters of the birds after they had settled down a little from a year or two of exhibition. There will be remarked in this contemporary drawing the globular masses of fluff over the hen's cushion and the thighs of both sexes; the short and soft tail; the moderately feathered shanks; the medium-sized single comb; the low and forward carriage; the short legs set wide apart. Yet there is one difference of a marked character, apart from the less amount of shank-feathering and absence of vulture-hock. The fluffy masses of the hen stand out in even more globular protuberance than they do to-day; and considering this further, we observe that the plumage of the *fore-part* of the body in both sexes is more tight and close-fitting than now, and hence this appears smaller in proportion to the hinder-parts. The difference is due more to plumage than anything else, for Mr. Sturgeon, writing in the same year, insists on "great depth from the base of the neck to the point of the breast-bone," and also on length of the latter. To this comparatively greater closeness of plumage over the forward portions of the body, while the hinder parts only were covered with deep fluff, we now know was due the greater laying powers of the Cochins of those days (see p. 174).

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* *Brahmas and Cochins*, by L. C. R. Norris-Elye. Published at *The Feathered World* Office.

One or two other details about these early Cochins are very interesting. Mr. Sturgeon wrote (of buffs) even in 1853, that "the eye should be *red* and full," since it had already been found that "in all cases of contracted pupil and blindness, the pearl or broken-eyed birds have been the sufferers." This weakness of the pearl eye, and even of light yellow, still remains. The early birds also bred most amazingly in regard to colour, and the finest of the early blacks were bred from a white cock and buff hen. From one brood of ten chickens of this cross, two pullets were pure black; two pullets and three cockerels black, with more or less gold in hackles, and marked wings; the other three darkly pencilled birds. Another breeder put a buff cock with dark partridge hens; the pullets from this cross were all light fawns. It has already been noted that Mr. Punchard's partridges were originally selected from the same stock as Mr. Sturgeon's buffs, one breeder preferring the light and the other the darker colours. To the same mixture of colours is no doubt due the number of varieties recognised in the early "standards," buff, lemon, silver-buff, silver-cinnamon, and cinnamon being all separately described.

Ten or twelve years did not make much change in the general characteristics of Cochins, yet a little is observable, as will be seen from the accompanying drawings made in 1865 by M. Jacque, the leading French poultry artist of that day. Though the head is ill-drawn, the cock here shows more "type" than the 1853 drawing, being more like the Cochin as we know it; and both birds show more softness and looseness of feather *over the whole of the body* than in the original type. It is this latter change which was to proceed so much further in later years, as shown very strongly in our plates of to-day, and reaching its climax, perhaps, in the American Cochin as now bred.

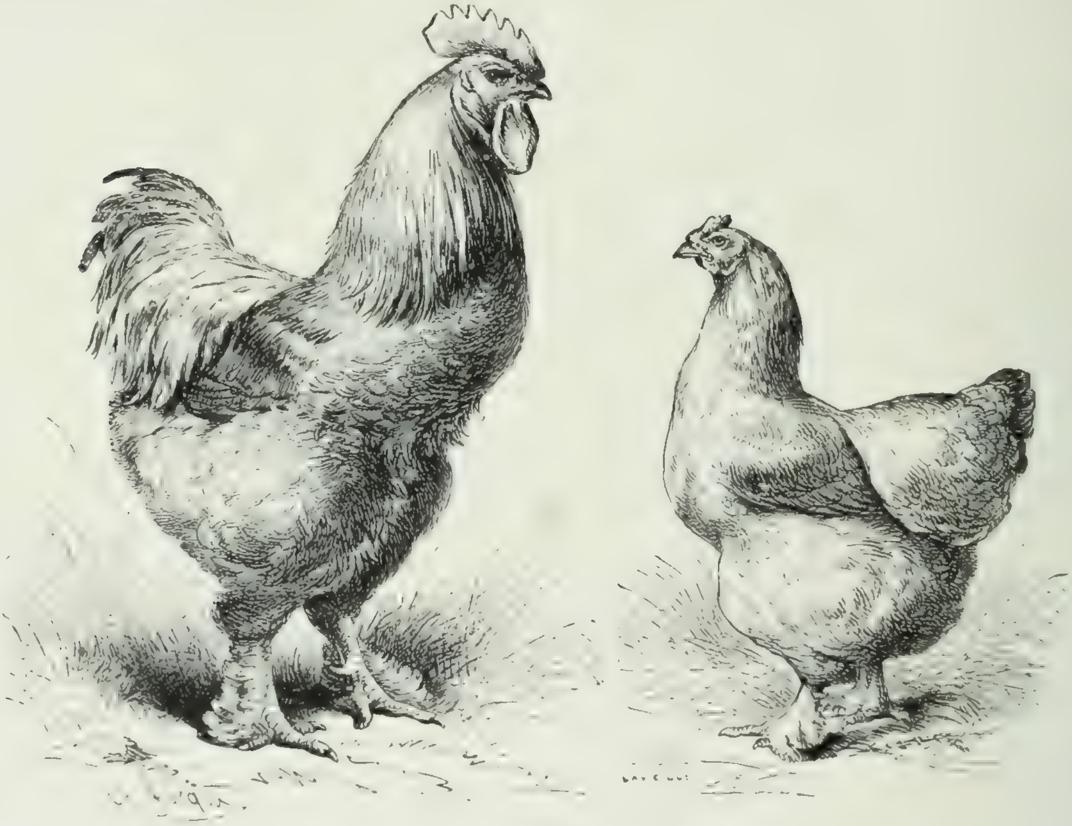

Fig. 87.—Cochins in 1865.

The last marked change which took place was the admission of vulture-hocks, due to the passion for heavy shank-feather, together with

Vulture Hocks.

most inconsistent conduct on the part of the then leading judges. These had carried practical disqualification for vulture-hocks to such an extreme, that birds with the least fulness of shank-feather were repeatedly passed over for what was really only nice covering with quite soft and well-curled feathers. That provoked reaction to excessive shank-feather, and birds were exhibited with hocks heavily plucked; and then almost of a sudden the judges gave way and went to the other extreme, and vulture-hocks sprang in with a bound, so far as England was concerned. It always seemed to us that heavy and stiff quill-feather was inconsistent with the *idea* of a Cochin; and it has been proved in America that heavy shank-feather can be bred without stiff hocks; but in England the hocked fashion has now prevailed since about 1875. As the Cochin, with this and other changes, has now become almost entirely a "fancy" fowl, kept up by fanciers solely, nothing can be said in objection to the standard they adopt; but the few birds now exhibited in comparison with the large classes which formerly appeared at large shows,* are an eloquent testimony to the change which has taken place in general appreciation of this once popular breed.

Characteristics of Cochins.

Turning next to the Cochin as it is bred to-day, its great characteristic, above all, is *massiveness* of appearance, especially in the buffs, which are superior to the other colours, as a rule, in Cochin character. The bird really is very large and heavy, a full-grown cock weighing from 10 lbs. to 13 lbs.; but a good bird looks larger for his weight than any other breed, owing to the fluffy plumage. This is thinner in the quill, broader in the web, and with more length of loose fibrils from the root than other breeds, thus standing out more from the body, and making it look larger, even on those parts where it appears to lie close. The comb is single and straight, only medium in size, with neat top outline and serrations; and these and the wattles and the face and lobes should be smooth and fine in texture, not red-pimpled all over. The head should be small, with a gentle and intelligent look; the neck rather short, and very full towards bottom of the hackle, which flows well over the shoulders. These are wide and flat, and the back so short that the saddle or cushion seems to rise to the stern almost from the base of the hackle. The saddle or cushion must be very broad, and rise well, all but burying the short tail of the hen; the tail of the cock should be as short, and the coverts or sickles as soft as possible, the whole forming a sort of smooth line with the saddle hackles. The body is deep and large every way, the fluff on cushion and thighs standing out as profusely as possible; but the wings are not quite so tight-feathered, or clipped in so close as formerly, but themselves carried more loosely from the body, so that the thigh-fluff in most birds does not show such marked "globes" as it did some years ago. The breast should come down very deep, and be well covered with soft plumage. The shank-feather should be very abundant, and stand well out from the shanks, especially at the weak place just under the hocks. In the hocks, as little of *projecting* stiff quill as possible is preferred, and to be sought for. Vulture-hock is objectionable, but the heavy feather down the shank must not be mistaken for vulture-hock. Close examination would reveal the different nature of the feather, for vulture-hock means hard quilled feathers standing out from the back of the hock. The shanks must be short and set wide apart, and the feather extend to the end of outer and middle toes. The attitude is rather forward, with the stern carried high, and the head (in comparison with most breeds) rather low, and the carriage is dignified.

Buff Cochins.

Coming now to the varieties of Cochins, at the head of them all stands the class of colours now all known as *Buffs*. As already observed, at an early date the buff colours were much sub-divided, ranging from the lightest silver-buffs and silver-cinnamons, through lemons and buffs, to the deep-coloured cinnamons, which would now be called almost red. The lightest of these colours were very pretty, the breasts being so pale as to be almost a French grey, while the hackles and top plumage of the cockerels were much darker. The propensity for uniform colour all over displaced these variegated colours, and then for some years the classes were headed "cinnamon and buff." The colour of many birds was still lacking in uniformity, and for several years cockerels occasionally won, which would now be called "tri-coloured," the breast being lemon or orange buff, the hackles and saddle much darker, and the wing darker still, even a red. Such birds did not breed well, besides their variegated appearance, and would not now be tolerated in any decent competition. It may be stated broadly that the chief thing now desired is *uniformity* of colour all over in buff Cochins. Of course the hackle, from its different texture, has a somewhat different appearance, and more solid, if not deeper tint than the body colour, but the *tone* of the whole is desired as uniform as possible. The following valuable remarks upon mating and breeding buff Cochins are kindly contributed by that well-known exhibitor, Mr. George H. Procter, Flass House, Durham :—

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* There were 58 buff cockerels at Birmingham in 1874.

"A good buff Cochin should be as large as possible, and should look bigger than it really is, owing to the plumage being so loose, fluffy, and soft. A tight-feathered bird I dislike very much, and consider such far from the true type.

"The head should be neat and nicely curved, and free from coarseness. The comb should not be very large, but evenly serrated, and free from thumb-mark and side sprigs. It should be of fine texture, and, as with the wattles and ear-lobe, a bright red. White in the lobe is a very common defect, and though close confinement aggravates the fault, it comes with age. The eye should be yellow or orange, though pearl is not objectionable. The beak must be short, strong, curved, and of a bright yellow.

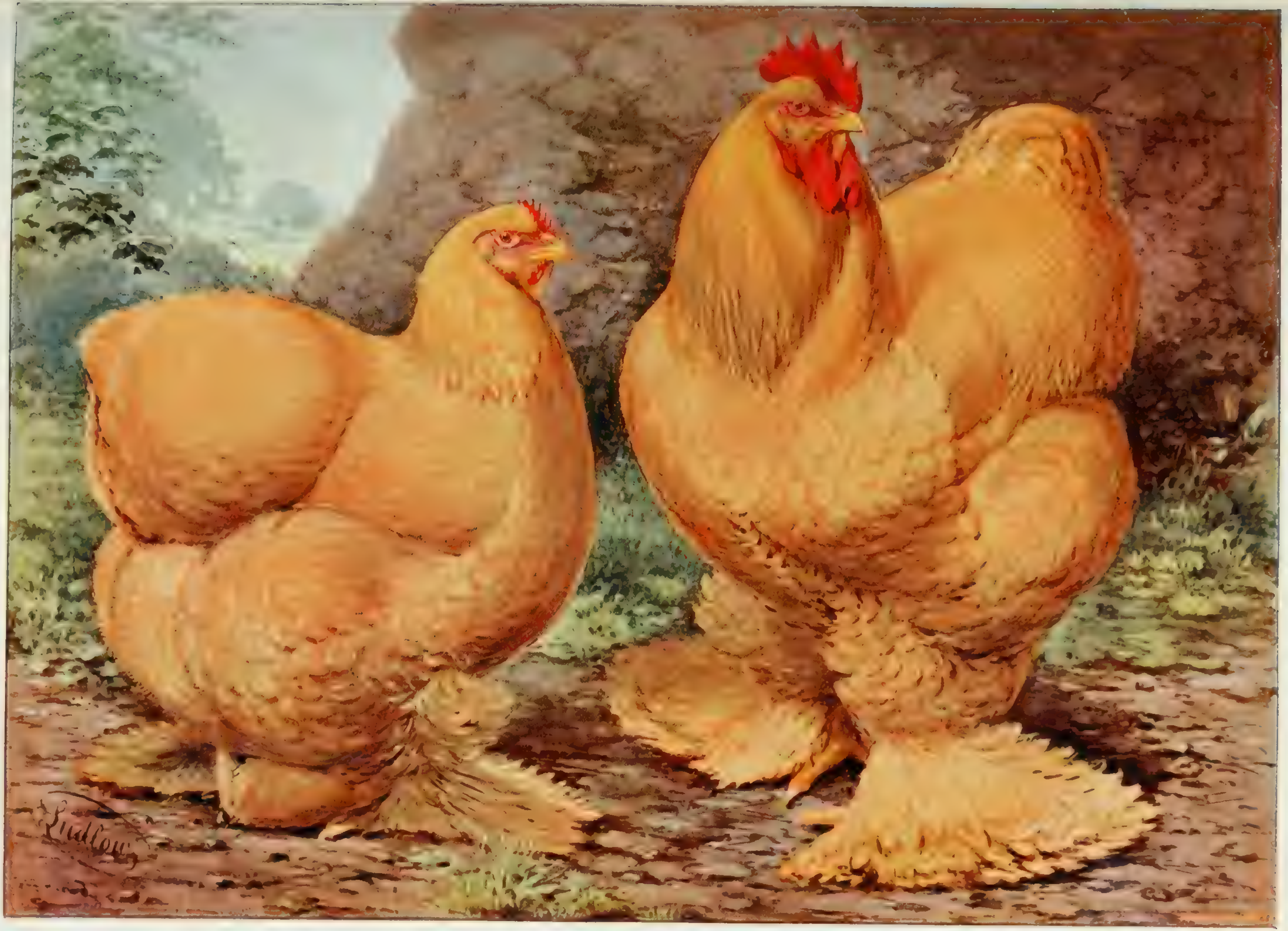
"The neck must be short, nicely curved, and covered with long flowing hackle. The back should be very broad, the saddle or cushion rising towards the tail, with an arch in the hen; in the cock the saddle hackle is very long, reaching well over the wing points. The wing must be short, the tips well tucked up, and, as I have said before, buried under the saddle hackle or cushion, but not carried too close to the body, as this does away with the loose feathery look a Cochin should always have. A slip or loose wing is a most serious fault, and the most certain to appear in the next generation. The tail of the cock should not be carried too high, but rather obliquely, with full, flowing, soft, ribbon-like feathers. Some birds are shown minus part of their stiff tail feathers, which I consider a great mistake, as, instead of improving their appearance in the eyes of a breeder (who can see at a glance the unnatural moult), it spoils the outline. The breast must be very full and broad, the feathers on the under side soft and curly.

"The thighs should be covered with long, soft fluff, and on the front curly feathers. The fluff must stand well out, and not cling to the sides, else, however good the bird might be, I should hesitate to use it in a breeding pen. There has been much written in days gone by about vulture-hocks, but I have always allowed a good deal of latitude in this point, and would rather have a stiff hock than a lightly covered joint, as this with scant shank- and foot-feather generally goes hand in hand. At the same time nothing improves the look of a Cochin more than a hock properly covered with soft feathers, curling round the joint. The shanks should be strong and set well apart. The feathers should stand well "off" on the outside, sometimes quite six inches, but on no account pointing downwards, as such are much more liable to be broken, and although there may be a great amount of feathers, they do not show to the same advantage in the exhibition pen. I strongly object to any break or scarcity of feather between the hock and shank. The feet are yellow in chickens, but in many old birds flesh-coloured, which I think quite admissible. The feathering should be very profuse and running to the end of the middle toe, which should be quite hidden from view. A badly covered middle toe I look upon as a great defect, and one likely to increase in the next generation.

"The colour of the cock is as follows: The neck and saddle hackle, in fact all the top feathers, should be of a bright rich golden buff, free from any red or bricky tinge, as well as any suspicion of mealiness. The breast, thighs, and fluff a sound, dense buff down to the skin, and not showing the rib of the feathers. A washy-coloured breast, chalky or blue fluff is considered fatal in a breeding bird. The tail coverts must be rich chestnut, and the stiff feathers free from black or white. The former is a fault many otherwise good birds have, but as pure buff tails can be bred, I consider that the black should be heavily penalised. The flight feathers, in a cockerel to breed from, must be of a sound, rich buff, without white or black; but in an old bird a little white is almost certain to appear, and, although by no means desirable, I should not penalise it much. Foot and shank feathers should be the same colour as breast and fluff, also free from black or white in a cockerel; but, like the flight feathers, in many cases a little white appears in the second year.

"The colour of the hen should be of an even soft buff throughout, with no suspicion of red or bricky tinge. All wing, foot, and shank feathers must be free from black. In no case should the rib of the feathers show, but the buff colour must run down the fluff to the skin. I dislike a hen with a chalky fluff much more than one of lighter top colour.

"For some time I noticed in the poultry journals a controversy going on respecting colour feeding. I am no believer in the system, for, in the first place, perfectly coloured buff birds can be bred without any artificial feeding, and in the second, I should say birds so fed would be useless for breeding purposes. As a



BUFF COCHINS

matter of fact my buff Cochins have never been subject to any such treatment, and I am quite certain I shall never allow it in my yards.

"In mating up a breeding pen, I select a cockerel that has not been exhibited, if possible, and do not mind if rather late hatched. He must have a neat, well-serrated comb, short, heavily feathered shanks and feet, especially the middle toe, together with a broad back, full breast, and plenty of fluff. He must be perfectly sound in colour, with a small, clear buff tail. The flights and fluff buff to the skin; if just a shade darker on the wing I do not object, but at the same time I strongly object to a red backed or tri-coloured bird, many of which have been awarded prizes and used for breeding by the inexperienced breeder, much to the detriment of the colour of the offspring, more especially of the pullets bred from such, as they come mottled, and show unsoundness on wings and streaky breasts. It is a mistake to think a dark-winged cock mated with light hens will breed sound, medium-coloured chickens. This mistake, I notice, is being made in other buff varieties, and so long as these dark cocks are allowed to win prizes, we will see faulty-coloured hens and pullets.

"When I am satisfied with the selection of the cockerel, for choice I should say put with him five two-year-old hens, large, roomy birds with neat heads and plenty of feather and shape, and of the same strain if possible. I do not mind if a bit pale in colour or mottled, so long as the colour runs down to the skin, and they are not chalky in their fluff. They should be as free as possible from black in tail. I consider the cock is mostly answerable for the colour and feathering, and the hen for size and shape, of the offspring.

"My old birds are fed twice a day, in the morning on sharps or middlings, mixed with a little scalded cut bone, or any of the patent poultry foods, given warm, and about 3 p.m. a good feed of sound wheat, a few acres of which I grow for the purpose every year, and find this suits my birds best. The chickens are fed every two or three hours for the first few weeks, mostly upon oatmeal, mixed with a little scalded meal and some chopped bone and hard boiled egg, but I soon begin to substitute sharps or middlings, mixed with some of the patent poultry foods. I get chickens on to small wheat for a change, and find nothing brings them on quicker than a judicious use of this grain."

The Buff Cochin being, as already intimated, the real progenitor of a whole tribe of buff poultry, it will be convenient to enter here fully, once for all, into the essential principles of breeding *all-self-coloured buff fowls*, ignorance of which has led to much failure and disappointment, the more so since a certain change of fashion already generally indicated above. Formerly some difference in colours on various parts of the body was recognised, the silver-cinnamons, for instance, having very light under parts, with much darker colour in the hackle and cock's upper parts, and in the tails. Such colours have now quite disappeared in favour of a self-colour, as uniform as possible all over. It may range from cinnamon to pale lemon in tint, but the tint is desired the *same* all over, with only the difference in shade or richness which the difference of hackles in texture of feather necessarily makes. This standard of colour has brought the natural tendency to black in tail into stronger relief; and nothing has been more common than for purchasers to insist, above all other points, upon any bird sent them having no black in tail. It cannot be too well understood that while a buff or bronzed tail is the ideal for a perfect bird, a cockerel with dark tail may be a valuable breeder, while one with no black in tail may be absolutely worthless.

Breeding Buffs.

The great essential in breeding self-coloured buffs, is freedom from any "meal" in the buff, or white anywhere in the plumage so far as growing stock is concerned (there may be some come in good old birds, as indicated by Mr. Procter above), and good buff under-colour. The latter means that the fluff at the base of the feather is to be buff, not white, or "buff to the skin," as it is termed, and the shaft of the feather also buff, not white. The web of the feather and surface of the bird may be buff, but if the under-colour be white or nearly so, good chickens will be very few. Many birds in any new strain may be very pale buff in the under-fluff at first, almost white; but as selection proceeds darker and darker should be chosen, until fairly rich colour is obtained. After that the breeder will have less trouble.

Mealiness in colour does not mean *mottling*, as when feathers bleach in the sun; it means a most minute speckle of white among the buff, like specks of flour, so fine as almost to need a magnifying glass to see it, and leaving the bird apparently quite a nice even buff, looked at carelessly. Such a bird will never breed good-coloured stock; but it is just such as are most generally free from black in tail, and often get chosen on that account; while on the other hand a cockerel with black in his tail, of the proper sound colour, and "buff to the skin," may breed most successfully, and be a very valuable bird, as may a pullet a little ticked in her hackle or dark in tail. There is so much tendency to "breed lighter," that these faults are far less troublesome than white under-colour, or any approach to "meal" on the surface.

Another point to be borne in mind, is to breed so far as possible from *darker* birds than the progeny are desired. One only has to mate two really pale buffs, to get chickens with a great deal of absolute white in them: that shows the tendency in this colour. If hens and pullets can be selected on the dark side, all the better; and even then the cock or cockerel should be decidedly dark—he may even be almost a rich red. This is still more essential if the females are not dark. But whatever colour the birds are, they must be *even* all over if the result is to be good, mottled or uneven colour in different parts being strongly hereditary. Even colour is, if anything, still more important in the male bird than in the female. One form of unevenness in colour is *lacing* on the feathers, with either lighter or darker buff, especially on the breast or wings. We have often thought that the darker lacing, which is most common, might easily be developed with care into a very beautiful variety; but in breeding for self-colour at least, it must be carefully avoided, being very apt to perpetuate itself.

Thirty years back the fashion in buffs was for what were called lemons, the under-parts being a rather pale yellow buff, while the hackles were a bright lemon. At the present time a rich medium shade of colour is preferred for the cockerels, although in the pullets the paler shades are tolerated at least by some judges. This variance of colour is the result of breeding the two sexes from separate pens. Birds have been shown almost bricky in colour; but of late some signs have been manifest of a disposition to regard with more favour again the brighter orange and lemon shades.

Buff chickens usually become darker in colour with the adult plumage, and in their first feathers often show a mottled and pale surface, which is very disappointing, but which moults out all right. This is rather curious in connection with the necessity for depth of colour in the parents, and must be borne in mind. Chickens which look dark enough in their chicken feathers, will very often moult too dark. This is to be remembered, and if they are bred from good parentage, such light chickens should not be discarded. After one season's rearing of his own birds, if from good stock, a breeder new to Buffs will know about what to expect in this way, and be able to do his weeding accordingly.

Partridge Cochins.

Partridge Cochins have gone down very much during the past ten years; why, is not easy to explain. In the early 'nineties Messrs. Mead, Woods and Holland kept the colour very much to the front, but with their demise the colour lost popularity. They have seen great changes since the early days, most of Mr. Punchard's early cocks having been brown in breast. Black was however preferred, and we have been told by several old breeders who remember those early days, including the writer of the following notes, that the origin of the black breast was a cross with Mr. Lacy's brown Brahmas of that time, which also tended to improve the marking of the hens. Most of the early Partridge hens were light brown, finely pencilled with dark brown, the shaft of the feather showing white over most of the body. Along with these were shown hens known as grouse, from their solid grouse pencilling without any streak in the shaft of the feather; some of these being distinctly traced to the cross mentioned just above. The streaky-feathered hens have since died out, and the grouse-feathered type, more or less modified, is the modern Partridge Cochin, with a black-breasted cock as show companion. The grouse marking was gradually bred to great perfection, and about 1868—the precise year is difficult to ascertain—there was introduced another cross

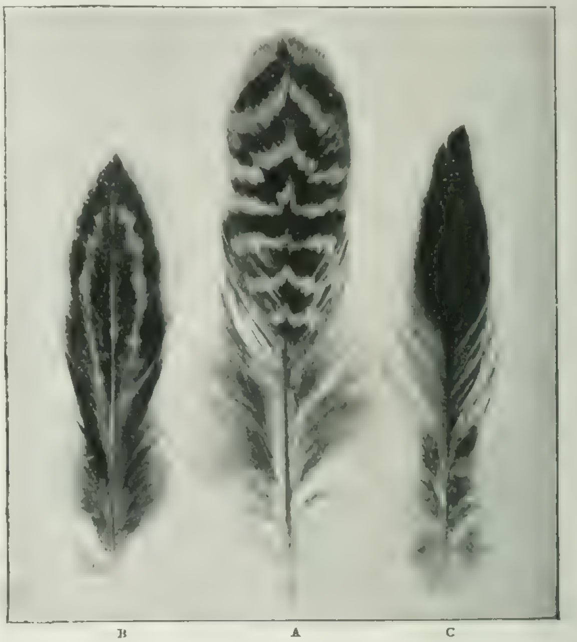


Fig. 88.—Partridge Hen's Hackle Feathers.

of more modern dark Brahma, which imparted the beautiful pencilling of that variety and a somewhat lighter ground colour, almost verging on yellow in some birds, with black markings. Still later there is evidence that there was at least one marked introduction of Brahma blood for the third time, with a view still further to "clear" the pencilling. With this cross came a smaller size and a narrow weedy build, which has not bred out yet, so that many Partridge pullets are the most inferior of any of the varieties in Cochin type and massiveness. This point needs special attention from the breeder. All strains have not been so crossed, and the result is apt to be, unless care is taken, some anomalies in breeding owing to such great differences in blood. We were told by the writer of the following notes of one very curious case, that of the best cup Partridge pullet perhaps ever seen at Birmingham up to even now, claimed at the price of £34, which was bred from a cock-breeding hen, of a mere mouse colour; but this mother of that splendid bird never bred another good one either before or since.

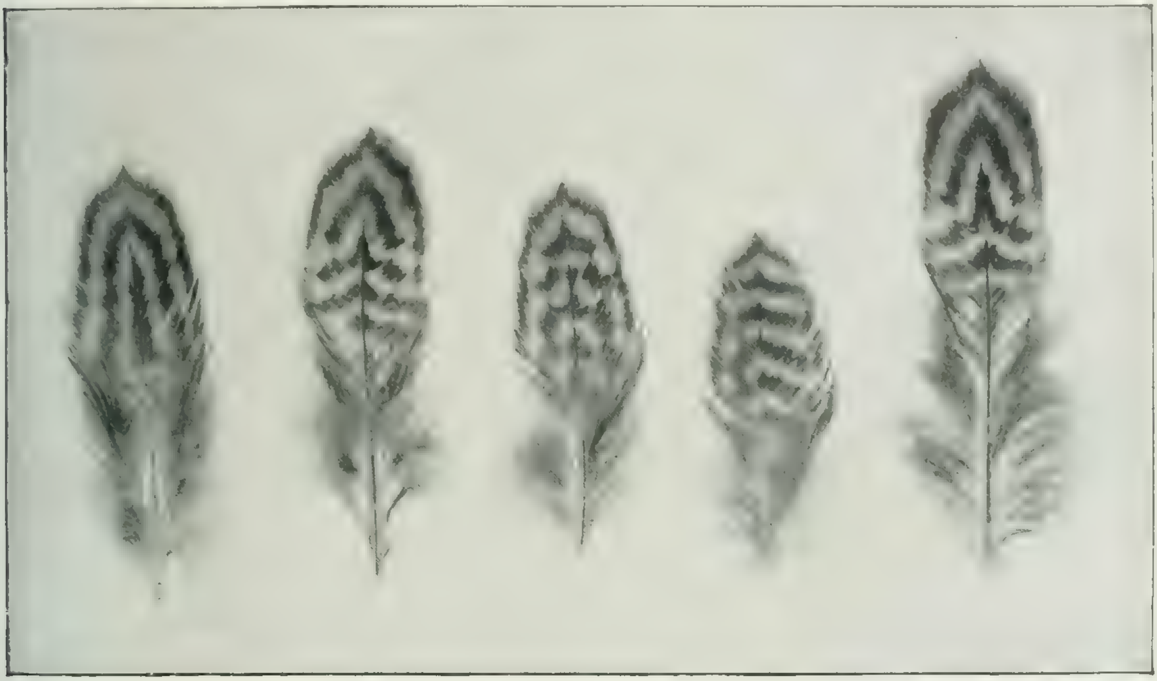


Fig. 89.—Partridge Cochin Pencilled Feathers.

The following notes are from Mr. Richard Southern, of Worsley, well known as one of the oldest and most successful breeders of Partridge Cochins, from the days of the late Mr. Edward Tudman downwards:—

Breeding Partridge Cochins.

"To breed Partridge Cochin cocks is now a very difficult task, the reason of which is I believe that they have got mixed up with the pullet strain, which tends to brown in the fluff, and too plain hackles. I have not bred the cock strain now for many years, but believe there is always danger in breeding from birds not black up to the throat and darkly striped in the hackle.

"To breed pullets the first thing is to choose your hens, which should, of course, be the largest and best-shaped possible, short on the leg, and plenty of foot feather, with, if possible, nice soft hocks; but above all things must be heavily pencilled from head to foot, the breast in particular. I have always bred my very best pullets from hens heavily pencilled in the hackle, and find these always breed the best pencilled ones, so that my strain of Partridge Cochins may be called a pencilled-hackled strain, and I have had it for over twenty years. These hens breed the striped hackle as well, and the three hackle feathers in Fig. 88 show this. Feather A is a heavily pencilled hackle from a hen three years old, which is the mother of both the hackles in B and C, one being a partially pencilled hackle and the other a striped. I have won scores of times with pencilled hackles, but prefer the striped hackle for a show hen ; but until you get them to breed both in this way, you do not get so many well-pencilled pullets.

"The cocks to mate with these hens should have a rich orange-coloured hackle, broadly striped with black, with a few brown *spots* on his breast, but not brown *patches ;* he should also be just a little tinged with brown on his fluff, and if his tail feathers have a very narrow edging of brown or bay I like him all the better, as this tends to breed pencilled tails in his pullets. The hens should be chosen a little darker than is required, as they will breed pullets lighter than themselves in regard to the greater portion. I have always chosen my breeding cocks from one to two or three years old, and the hens the same, and never breed from cockerels and pullets. One reason is that I have had many pullets that did not moult out as I should have liked, and it is much safer to breed from those hens which have improved in pencilling up to one or two years old. I also choose my hens and cocks (for breeding) with the shaft of the feather almost black to the skin."

Fig. 89 is photographed from feathers of this old grouse strain, and will show the perfection of its marking, the colour of these being almost black on a light brown ground. But the specimens have also been selected, out of quite a number sent us by Mr. Southern, to show how remarkably a strain bred for many years *for pencilling*, without a cross, tends gradually to approximate to the Hamburgh type of pencilled marking, a feature much in evidence to-day. The hackle of the mother hen in Fig. 88 also shows this character strongly. In Fig. 89 A and E are a breast and cushion feather from the same hen, and in the latter Hamburgh-like bands of pencilling appear at the base of the feather. But the tendency is shown still more strongly in B, C, and D, which are all breast feathers ; B from one, and C D both from another or different pullet : the two last are specially suggestive in regard to possibilities of pencilling.

The Brahma-crossed pullets, which are more often seen, exactly resemble Brahma feathers in the character of their marking ; and the ground colour, though not yellow, generally partakes of a brighter tinge approaching that colour, while the marking really is black, and varies from narrow markings to broad bands, as in strains of Brahmas. What is said above as to pencilling of the hackles also applies to these birds, though marking so nearly approaching that of pencilled Hamburghs is rarely found amongst them. Good pencilling should be looked for in fluff and foot-feather, as well as on the body and breast. The males for these birds will have as a rule orange red hackles, and should be marked on the breast and fluff, the black feathers having either an edging or lacing of brown, or a small pear-shaped tick at the end of each breast feather : either will do, provided, of course, the bird be of the pullet-breeding strain, and have hackles densely and sharply striped, especially on the saddle. If there is a little fine black edging round the tips of the hackles, as well as in the centre stripe, it is none the worse for a pullet-breeding cockerel.

Apart from the glossy black breast, and dense black fluff and foot feather, which are now expected in him, the exhibition Partridge cock is deeper or richer in colour than the one for pullet breeding. His hackles are preferred of a deep reddish orange, or even red, while the wing-bow and shoulders and back are of a glossy red, almost crimson in tone. When the condition is good and the gloss on the feather is perfection, the upper part of a Partridge cock is a gorgeous display of colour, which hardly has a parallel in any other breed for its beautiful waxy lustre and brilliance.

To breed these birds it is no use now to use exhibition or grouse-marked pullets. The male must, of course, be chosen as perfect as possible in all exhibition points, including Cochin character as well as colour, the most common fault in the latter being white in tail, which clings to this breed with extraordinary persistence. The hens to mate with him are very dark all over, the ground-colour of the feathers being *dark* brown nearly as dark as roasted coffee, covered over with very small and minute pencilling, too close to be distinguishable as bands, and almost black. The feathers of such a hen are shown in Fig. 90, and the great difference between them and the grouse-marked feathers on p. 247 will be observed. These feathers very often show a little white in the shaft, which does not matter much ; and altogether it is very obvious that this strain contains more than the other of the older Partridge blood. The entire bird is very dark and dull looking, and the cushion feathers are often almost dull black, except for a narrow lacing of the brown ground ; birds without that lacing breed cockerels not bright enough. It does not of course follow that all dark and dull-looking hens like this will breed exhibition cockerels ; but if they are the next relatives of such, and therefore of the right blood, there will be little disappointment after the strain has been bred a year or two.

this is not correct. It is the upper pair of true tail feathers which curve outwards, like the tail of a black-cock, and the fine sickles curl over between their opened ends. In another type of tail, the whole group of feathers appears to spread out laterally. Neither type is very common now, and if we get a handsome tail, with a good sweep, we may be satisfied. The saddle should on no account get narrower towards the tail.

The breast should be deep, broad, and rather prominent, coming well down between the thighs. These and the legs ought to stand wide apart, and the latter be fairly short; but they certainly may be *too* short, though this does not often happen. They are to be feathered as heavily as possible down the outside of the shanks, and to ends of outer and middle toes, with the feather sticking out well, especially under the hocks, which is the difficult place to get good feather. As a rule the inside of shank, and back toe and inner toe also, are more or less fluffed or feathered too, which is not a beauty. The required leg-feather is practically always accompanied in England by vulture-hocks, for which we have already expressed regret, as usually accompanied by coarser skin and deficiency in breast. But there is a great difference in vulture-hocks, some of them projecting far more than others for the same amount of real feather; and very offensive-looking hocks should certainly be penalised, as against those in which more downward direction or curling in, diminishes their prominence. The fluff should be fairly abundant and well covering the thighs, though neither so full nor so downy as in Cochins. The wings are of medium length, considerably longer than a Cochin wing, and should be tucked up rather tightly. The toes should be well spread apart and straight: a curved toe is rather often seen in this breed, perhaps from its weight.

The hen should present the same small head, which in her case looks particularly arch and coquettish when of the right model, yet with a sweet and gentle expression also. The body should present the same deep-breasted general outline; and in her case also there is the same characteristic difference between her cushion and that of a Cochin, the cushion of the Brahma rising more and more to the tail, which stands out at the end, instead of drooping as in the other Asiatic breed. The fluff is abundant, but should not be globular, the general appearance being rather square than rounded. The cushion should also grow wider and wider towards the tail, though of late many Dark birds have tended to run off narrow and weedy. The Light pullets, on the direct contrary, have often shown such enormous fluff and cushion as closely to resemble the Cochin type. Some breeders and judges evidently prefer this stamp of bird, which is often of great size; but such a model is foreign to the original Brahma and should be discouraged.

Light Brahmas.

We must now deal with the colours separately, and will take Light Brahmas first. In this breed the real ideal of colour has not varied much, though different faults have appeared at different times. The comb and face have been described above; the rest of the head of the cock is pure white, and the hackle below silvery white, more and more striped towards the bottom of the neck with black. This stripe should be as intense and sharp as possible, and run well up the feather, the edges being sharp and the edge of the hackle white. We have seen magnificent birds on the rather dark side, with a black edging as well as striping to the lower hackles, and are bound to say we thought it looked very handsome, but it is considered a fault, and is also a sign of too much colour in the stock. The most difficult part of the hackle to get good marking is where it comes round to the front of the neck. The hackle cannot be too full and flowing, and should slide like glass over the shoulders and back. The head and neck of a Light Brahma cock, both literally and in fact, form the frontispiece to the entire bird. Red or bay is the best colour for the eyes, but the lighter colour is fully recognised.

The shoulder-coverts and back between them are preferred white on surface, but are black quite as often underneath the hackle, at the part often called the cape. The saddle hackles are by most preferred white, but these also are allowed to be striped, though it should be much more thinly than the neck, and general harmony requires that a striped saddle should accompany a rather dark and brilliantly-coloured neck-hackle: personally we rather prefer the striped saddle. The tail is black, except that the top feathers may be narrowly laced with white: tail coverts black, edged with white. The primaries are black, edged or not with white on the outer web: secondaries, white on outer web, and generally on a little of inside web, rest of the inner web black. The rest of the body and fluff is pure white on the surface, with either white or bluish grey under-fluff; the shank-feather may be either white, or preferably with some black mottling. The shanks should be brilliant yellow. All the black except in shank-feather, should have as much green gloss as possible.

The hen is the same general colour, the head being white, and the hackle lower down broadly and densely and sharply striped with black. Her tail is black, or may be laced with white, and primaries and secondaries of the wings, and shank-feathers, are as in the cock. The rest of the body pure white all over in surface-colour, except the rearmost tail coverts, which are black edged with white, and the cape between shoulders, which is often more or less black. The under-fluff may be either white or grey as in the cock.

Breeding Light Brahmas.

We have now to consider how such birds are to be bred: a task which is not easy according to the high standard of the present day. To have any chance of success, a cock or cockerel *must* be selected with neat head and comb: the male bird is all-important in these points, and the day is gone by when a coarse head and a bloated mass of red can win at good shows. The bird must, of course, also be typical in shape and size; but on the other hand, if he is really good in other points, there is no need that he should be large. Size is the one point in which, if necessary, expenditure may be saved.

The next most important point to look after is the quality of his colour; by which we mean, not the amount of black he may have, but that his white is clear skim-milk white, and the black a dense black. The same remarks about what is called "sap in feathers" while growing, made in the case of Cochins, apply here also. If such a bird can possibly be got, one that has been white as a cockerel, and moulted white, and grown his feathers white whilst in the quill, will save a lot of trouble in breeding out yellow tinge later. The point is not quite so vital in hens, but in their case also this pure real white, not cream, is the point of greatest value. Brown or indistinct striping in the hackles, will also entail tedious work later on to breed them good.

The *amount* of colour in the birds mated is the final thing to be considered, so far as colour is in question. If a cockerel as first described can be secured of the exhibition type, and also pullets or hens of the *ideal* exhibition type, that is, with hackles really sharply and densely striped like Fig. 91, and nicely edged tail coverts, and both sexes are really free from all surface splashes or ticks in undesirable places, this mating will usually produce good chickens of both sexes, unless too "raw" a cross (as explained in Chapter XI.). But such mates are very hard to get. The standing difficulty remains where it was years ago, in getting sufficient marking in the hackles and about the tail, without ticks or splashes of black where not wanted. Of late birds have been shown with darker hackles and saddles than formerly, and pullets with their hackles almost black; and as a result there have been too many in the pens showing black specks all about the body, or at the ends of the wings, or splashes on the hocks or amongst the fluff. This may occur from mating either dark hackles together, or when both of the pair have grey under-fluff, which is undesirable with the present stock of to-day. Both sexes being of exhibition standard in colour, therefore, if one sex has dark under-fluff, the other should have white; and if the cock has a striped saddle and somewhat dark hackle, both may often have white under-colour with advantage. The result will then depend chiefly upon the density and sharpness of the hackle-striping, particularly in the hens. If the cock is not particularly dark, but what may be called a nice average, it is as well to have one or two of his mates with rather too dark hackles, the produce of which may often be amongst the best of the bunch.

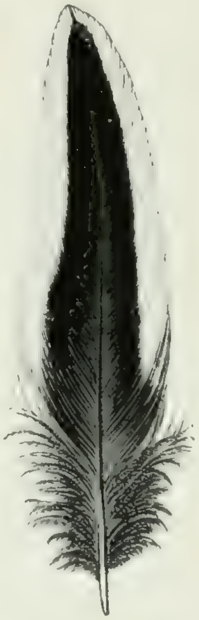


Fig. 91.—Show Hackle.

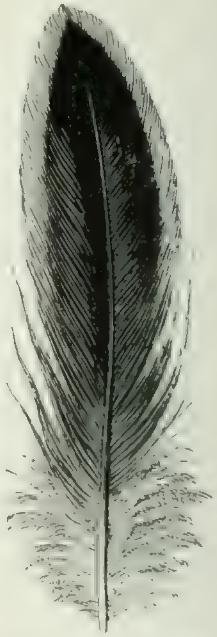
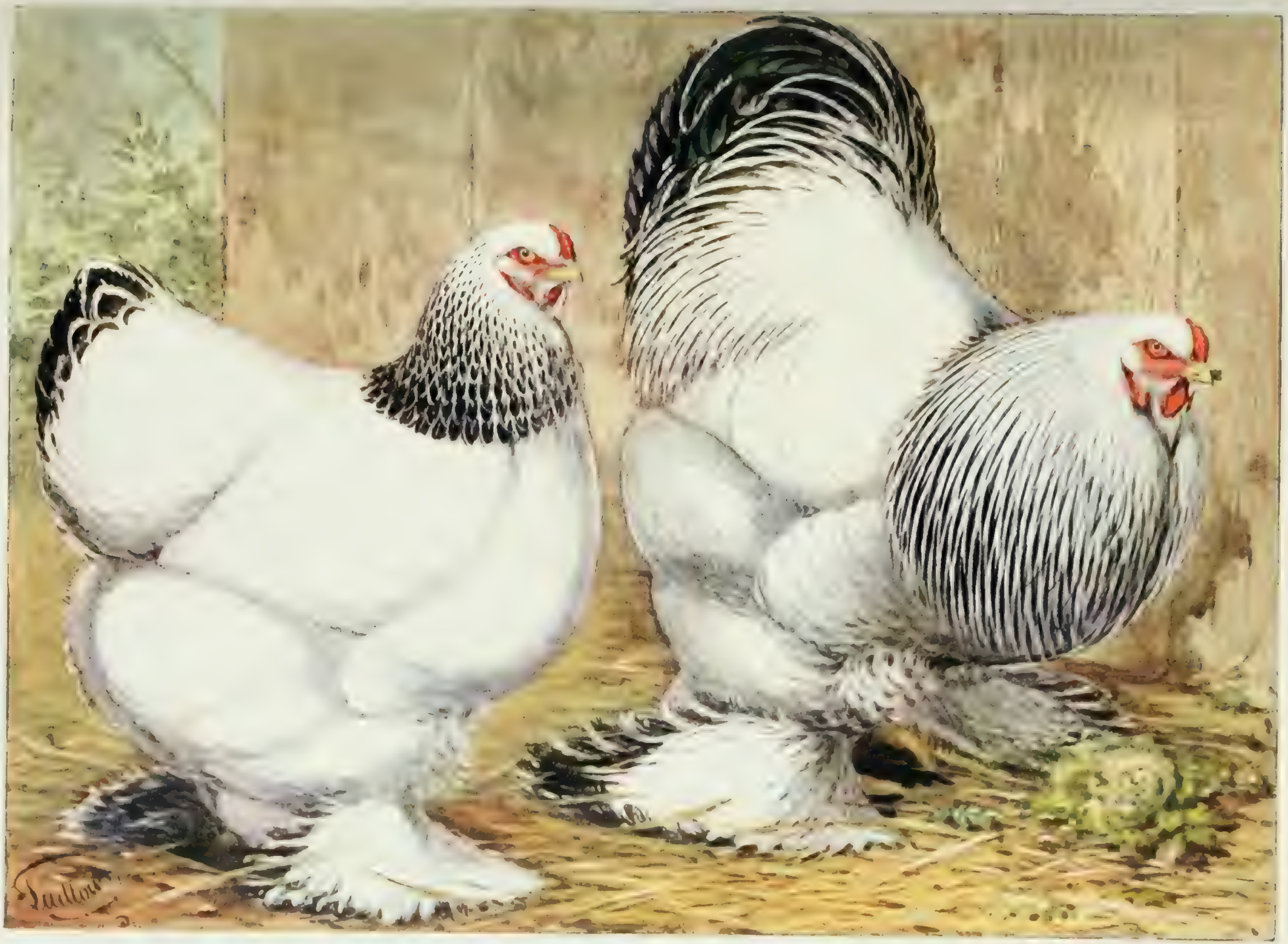


Fig. 92.—Dark Hackle.

The above may be termed exhibition mating or single mating, and this is a breed in which with care that may at least be bred up to, if not always possible at first. But there are other ways of mating which are quite successful, balancing too much colour on one side by less



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LIGHT BRAHMAS

on the other. Fig. 91 shows a hackle such as is desired in a light Brahma pullet or hen, and Fig. 92 another such as is very often seen, and which has even won at times, though seriously faulty owing to the black extending almost or quite to the edge of the feather. It is the toleration of such hackles in winners, with striped saddles in the cocks, and breeding the two together, which produces so many birds with black ticks or splashes all over the body, but especially the back or the hocks. But if a female with such dark hackle and free from black splashes be mated with a cockerel clear in saddle with rather narrow stripes in his hackle, while not more than one of the pair has grey under-colour, the produce is usually quite satisfactory in regard to pullets; and there is often a certain portion of very fair cockerels, though mostly, like their father, rather on the light-hackled side.

The converse mating is also often satisfactory to a large extent, putting a very dark-hackled cock with striped saddle to hens deficient in striping. Success will depend upon the striping in both cases being sharp and dense, what there is of it; and the greatest difficulty in Light Brahma breeding has been the undefined or cloudy hackles, which have been tolerated in so many hens. Such cloudiness gives no end of trouble, and can only be bred out of by degrees. But where the hackles are sharp, this mating also often breeds very well. Perhaps in this case more cockerels may be expected good than pullets; the number good and quality of the latter will largely depend upon whether the mothers are free from ticks and splashes, especially on the back, and a proper balance of under-colour.

We lay stress once more on the absence of black elsewhere than in the standard places. It is mere common-sense, one would think, though some do not appear to see it, that if a pullet not too dark in hackle, *also* has a lot of black showing all about her, she is full of surplus black blood, sure to come out in all ways, but especially in that same way which it is so desirable to avoid. On the other hand, if we get hold of a bird which is too full of colour in hackle or tail, or both, but clear white all over where it should be white, and maybe light in under-fluff as well, such a one may be invaluable. Her colour is too great, but all of it is where colour is wanted to appear, and this tendency is of all others most valuable.

There is no doubt that many strains of Light Brahmas have been produced by crossing with White Cochins, but now the strains have become pure owing to no crossing of late, and no need for the infusion of fresh Cochin blood. Many years ago, however, we were informed at Birmingham by a well-known winner there, that his birds there had been bred from a Dark Brahma cock and White Cochin hens; and we think it not unlikely that the greater prevalence of black ticks and splashes for many years past may be due to this infusion of all-over dark blood. The result has been increased size, width, and especially fluff about the thighs, many Brahmas now shown being far more wide and fluffy on the thighs than Cochins themselves. There is besides to be seen in many birds, a body-plumage of very wide, soft, fluffy feathers, entirely different in size and texture from the closer plumage which may generally be seen only one or two pens off, and so compared with the other. Some breeders evidently like this Cochin model, heavy and torpid as it is compared with the more square, compact, and active Brahma type, and no one has a right to pronounce as to matters of preference. We would only urge, as indispensable, whatever the width or the fluff, that at least the rising cushion and tail in the hens, and the grand *sweeping* outline in the cocks, be preserved. How these points may be shown even when combined with great massiveness, Mr. Ludlow has shown in the illustration.

Dark Brahmas.

The head of a Dark Brahma cock should be almost similar to that described for the Light, but though correctly called white, there is a sort of pearly grey about this white rather different from the snow white of the other. In the neck hackle there is less latitude of colour than in the Light variety, it being essential that the neck hackle should be broadly and densely striped with brilliant black, extending well up the feathers as in Fig. 93, and with any white shaft showing as little as possible, the rest of the feather being a brilliant white, unless occasionally the extreme edge may show a sharp and very fine black edge near the tip, as also shown in Fig. 93. The saddle hackle is also brilliant white, more finely striped, and generally showing rather more white shaft in the feather, as in Fig. 94. What little there is of back should be silvery white, but between the shoulders, where the hackle flows over it, the feathers are black laced round with white: a cockerel has much more black here than a bird in his second year, and black often mixes partly in the white of the back also. The saddle hackles gradually merge at the rear into the tail coverts, which are more and more broadly striped with black, until next the tail they become quite black, the tail and sickles also being black, unless the upper pair of blackcock feathers are thinly laced with white: white in the tail otherwise is a great blemish, not uncommon the second year. The shoulders and wing-bows are silvery white in old birds, usually mixed with black in young ones, but should be free from brown or red feathers: the wing-coverts form a brilliant black bar across the wing: the secondaries are white on the outer web except a large spot at the end, this and the inner web black, leaving the wing very white : primaries black, with or without a white edge on outer web. All the black feathers of these upper parts should be brilliantly glossed, a green gloss being best, but a purple tinge is not a very serious defect. The breast and thighs and underparts are preferred solid black in an exhibition bird, but small mottling on the breast and lacing on the fluff, or fine white lacing on breast and fluff, are in theory and standard admissible, though practically they seldom win: the shank-feather should mainly correspond with the other underparts, but with even a black breast, a little white there is quite permissible. A real silvery whiteness in the white, free from yellow or straw, is one of the chief points in colour. The shanks should be deep yellow or orange, but any distinct yellow is sufficient.

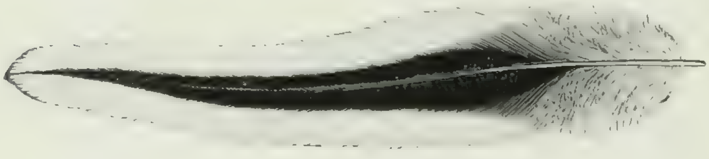

Fig. 93.—Hackle of Dark Brahma Cock.

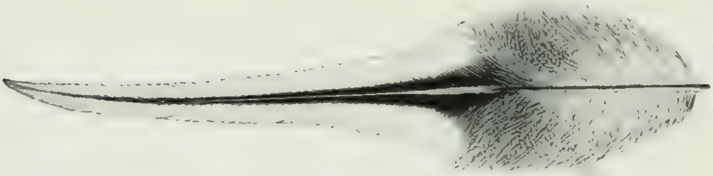

Fig. 94.—Saddle Hackle of Cock.

The colour of hens and pullets has varied more than in any other breed. Up to about 1870 there were two distinct schools, Mr. Boyle advocating a "dingy-white ground" closely pencilled with dark steel-grey, and Mr. Lacy, whose birds were usually largest in size, openly preferring very dark brown pencillings on a dark brown ground. This preference is historically very significant, because Mr. Burnham has often asserted* that his birds were always free from brown or any colour but fine steel-grey; while Mr. Lacy wrote us personally in 1867, that he had then been breeding Brahmas fifteen years, ten of which were in America. he therefore bred them there from 1852 to 1862, and either Burnham's must have been brown, or there was, as early as 1852, other Dark Brahma stock obtainable, which originated the strain he brought over. For years Mr. Lacy was a most successful exhibitor, and his birds were used to cross Partridge Cochins as already related; but this absolutely brown Brahma has now practically disappeared. For many years now, the pencillings at least have always been black or dark steel-grey, but the ground-colour has varied greatly. For a good while it was a grey which had a slight tendency to brown on the sides, and usually moulted rather browner in the hen; while there was also exhibited almost a slate or bluish ground, with black markings, the two schools being equally beautiful. The latter was known as the blue-grey, and Fig. 95 represents a set of feathers from one of the birds which won at Birmingham in 1871: it will be noticed that the markings are finer than those photographed on a later page from birds of 1900. Then for a time the judges went for a new marking which burst out suddenly, broad green-black bands, on a darkish ground with perceptible brown in it, but the whole so rich as not to look the least dingy. The colour would have passed well enough, but the pullets themselves were quite small birds, of no Asiatic shape at all, narrow and weedy and nearly bare legged—there simply never was such a farce in poultry-judging. After a few years of this, the judges threw it over and went for a pale silver-grey pencilling: these birds were better than the others, but moulted very dingy, and also lacked substance: this also could not last, and was succeeded by the massive hocked type that has since prevailed.

The colour of the pullets now fashionable is a pure grey ground colour with black or nearly black pencillings, as nearly uniform as possible all over the body, breast, back, wings, fluff, and leg feather, with black tail and striped hackles. This colour used generally to show brown areas or patches, and moult brown in the hens, but recently many birds are practi-

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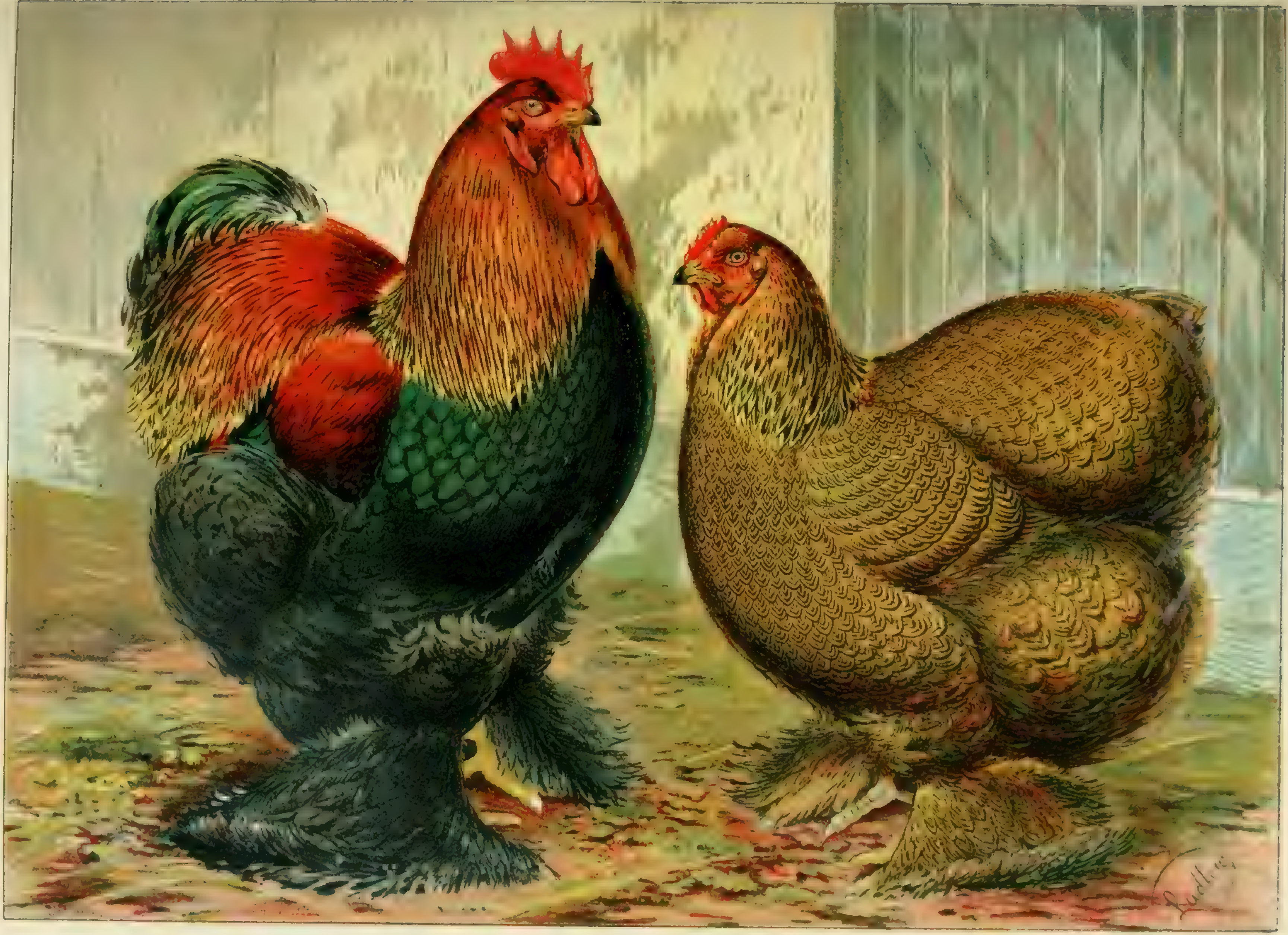
* In *The China Fowl*, and many places elsewhere.



8

PARTRIDGE COCHINS

The hackles of these hens should be deep reddish orange, with a broad and dense black stripe resembling C in Fig. 88.

These dark hens are often of noble and massive proportions, and hence the males of this variety are at present often better than the females, which, since the last Brahma cross for pencilling, have too often been small and weedy. It was very striking, until the older style of marking had died out, to see the two side by side, and mark the grandeur of the older type compared with the modern. The increase of size and Cochin shape in the exhibition females is the most pressing desideratum in Partridge Cochin breeding, and much might be done by selecting the finest birds, and systematic feeding for size, as treated of in the earlier chapters of this work. Even a cross from the browner and more massive type of Dark Brahma hens might possibly prove useful; it being obviously the smaller paper-ground birds, chosen for beauty of marking, which have done the mischief, and whiteness of ground not being necessary in the Partridge Cochin.

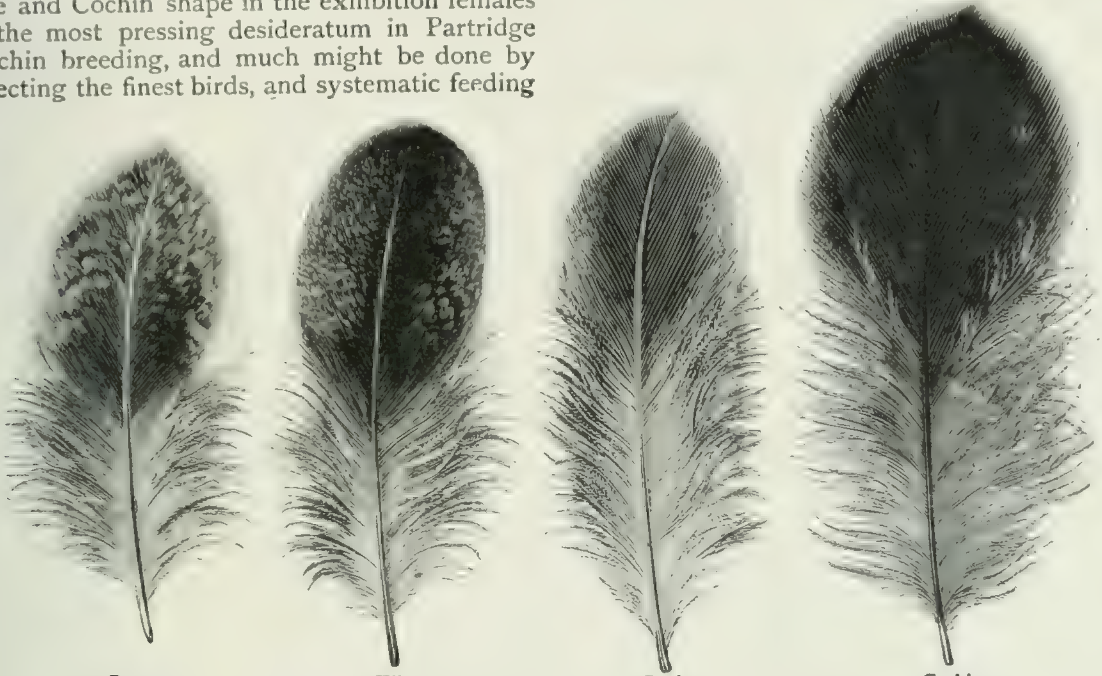

Breast. Wing. Back. Cushion.

Fig. 90.—Feathers of Cockbreeding Partridge Hen.

Black Cochins.

Black Cochins have been known from the earliest days, but until comparatively recent years have been little bred in comparison with other varieties, and generally behind them in Cochin quality. At the shows of recent years, however, the specimens shown by Capt. R. S. Williamson and the Rev. F. Sutton Dodd have, in several instances, surpassed both Partridges and Whites in size and form, and awakened quite a new interest in this variety amongst Cochin breeders. For their slow progress in early years there were several reasons; one being the predominant rage for buffs and whites, and another the scarcity of stock, which led to in-breeding, and caused want of size and weediness of build, the proper methods of line-breeding not being then understood. Another reason was the attempt to keep up bright yellow shanks, which all black fowls strongly resist. From one cause and another they had become nearly extinct, when the introduction of Langshans in 1872 gave strong fresh blood, renewed size, and better colour. Such a cross now would be hopeless; but the illustration of the original Langshans on a later page will show that at that date the poor existing Black Cochins had little to lose even in model from the new blood as then known, and the chief change really wrought by it was in the question of leg colour. For a time this was generally quite dark, as in the Langshan, but gradually a very dusky yellow came to be generally recognised as the correct type, and the strengthened stock has been, with the aid of other Cochin crosses, bred up to its present standard.

The following notes on Black Cochins have been kindly contributed by Capt. R. S. Williamson, of The Grange, Hednesford, well known as one of the most prominent breeders and exhibitors :—

"Seeing the popularity of the Buff and Partridge Cochins amongst poultry fanciers, it is somewhat remarkable that Black Cochins are not more largely kept. They possess many advantages over the other varieties from an amateur's standpoint ; they are nothing like so troublesome to keep in show form, and in smoky and dirty neighbourhoods they can be kept where it would be impossible to keep the other varieties. Again, in exhibiting Black Cochins it is not so necessary for the would-be exhibitor to be an 'expert,' as beyond taking proper care of the foot-feather very little is required. And as regards a utility point of view, they will compare favourably with any of the Cochin varieties, and for hardiness they cannot be beaten.

"Many years ago exquisite Blacks were shown. Some writers consider they were bred from Buffs and Whites. More recently the crossing of a dark male Partridge Cochin with female Black Cochins had been known to produce most excellent birds ; but oddly enough only the pullets came pure in colour, the cockerels in nearly every case showing red or coloured feathers in their neck hackle. The introduction of crosses has no doubt been the means of getting size into the breed, but at the expense of disgusting many would-be breeders and exhibitors, by the appearance of discoloured feathers amongst their stock. Once these red or discoloured feathers get introduced, it takes considerable time and trouble to breed them out. If a cross has to be tried, it should be of Whites, as by crossing two distinct colours like black and white, an improvement may be given to each variety. No doubt some years ago the Langshan blood was used to get colour ; but this spoilt the shape and type, and accounts for the huge tails some of the Black Cochins possessed years ago.

"The chief characteristics of Black Cochins, apart from their being a lustrous green black, are much the same as in the other varieties of Cochins. The question of colour of leg is however one that has not yet been definitely settled. Some breeders maintain that they should have bright yellow legs, others dark slate colour, and by others again the "lizard" or dusky yellow is preferred. The latter colour is, I consider, the correct one. The yellow leg has no doubt been got by crossing with the other varieties of Cochin ; and from a breeding experience of over thirty years of this variety, I invariably find that the bright yellow legs bring discoloured feathers. The dark slate-coloured legs may be attributed to the Langshan cross, but stock with this coloured leg produce a much larger proportion of pure coloured birds. The lizard coloured leg birds have also been found to be much more reliable to breed from than the yellow, and, from an extended experience, should, I think, be taken as the standard, as they are much more characteristic of the Cochin than the black or slate-coloured.

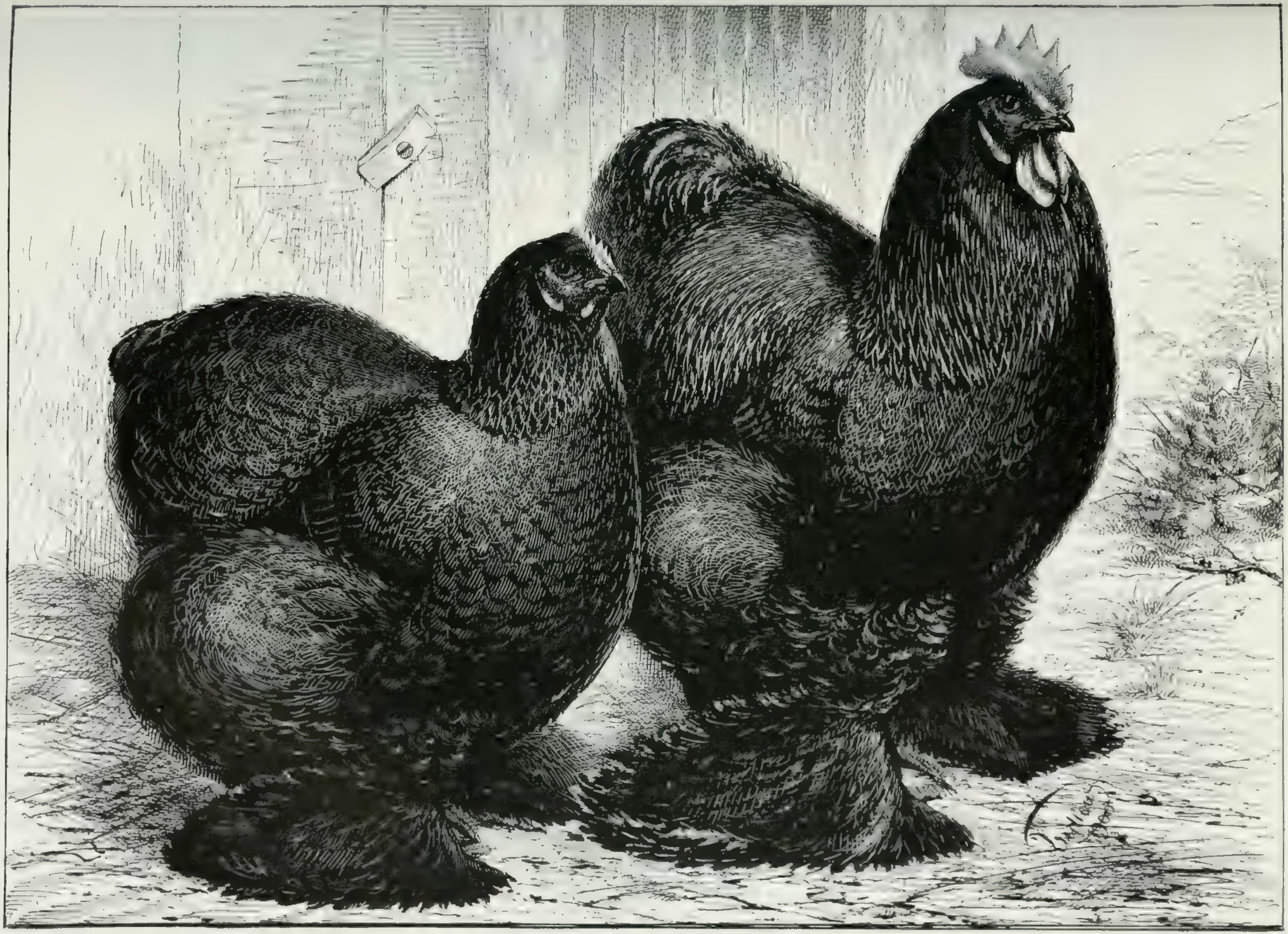
"Regarding the other points, a pure and bright colour should be insisted upon ; either red or black eyes ; and the shape should be similar in every way to the other varieties of Cochins.

"It is most gratifying to see the progress Black Cochins have made during the last few years, a very great improvement in size, shape, foot-feather, and colour being noticeable ; and in addition, at our large shows, where only, unfortunately, classes are given in the majority of cases, the entries in many instances have come up to those in the Partridge and White classes."

There is not the slightest doubt that a large proportion of the early Black Cochins really were bred from Buffs and Whites, as stated in the early part of this chapter : the fact is recorded both as fact, and actual personal experience, by the authors of the *Poultry Book* of 1853, as also the fact that other specimens had been imported direct. These latter appear to have been the inferior of the two, for the same authority states that "some of the best" had been bred from the cross. At a Bristol show of 1855 we distinctly remember the Black Cochins as having *bright* yellow legs. No breeder of any black fowl need be told how the attempt to keep up this must handicap a black breed ; but now the dusky leg is finally acknowledged as in the "Standard," there is no reason why Black Cochins should not enter upon a new career.

In this respect the modern Black Cochin possesses several present advantages over the other colours. The hardiness above spoken of, is beyond doubt due to the several recent infusions of new blood already referred to. Its superiority to the other colours as a layer, which is noticeable, is partly due to the same cause, but is further due in part to the desire for *lustre* in the plumage. This cannot be attained with too soft and fluffy body-feather, but demands a certain closeness of texture over those parts of the body where lustre is desired ; hence in this respect the Black Cochin approaches rather more the older and better laying model, while at the same time fluff and cushion can be developed in ample proportion.

In regard to colour, it is possible to overestimate the effect of crossing in producing the



BLACK COCHINS.

red or golden feathers which are so tiresome in breeding. Crossing would of course increase these; but *all* black fowls, however well bred, have more or less tendency that way — even Spanish and Hamburghs manifest it occasionally. In one way, red may be regarded as a sort of excess in *lustre;* and though the colour should as a rule be bred out rigorously, and green gloss selected for in breeding, it is an undoubted fact that if lustre has become deficient in the females of black races, it can sometimes be restored by the use of a male with a little red in his hackle. The lustre of these birds is best attained and preserved for exhibition by keeping them for some weeks out of the sun and strong light; the rest is health and condition.

White Cochins.

White Cochins were shown of very high quality from quite early days, those exhibited by Mrs. Herbert then, not being surpassed for many years: in regard to hens, indeed, many good judges considered that the Whites surpassed all others in Cochin points and development at this period, though of the cocks so much could not be said, the tails in particular being as a rule too long. One reason for this curious superiority of White hens over other Cochins, probably lay in the fact that much heavier leg-feather was bred for; yet since body shape and feather has been improving, the leg feathering is not so good as in the earlier days. However, the past five years has seen a great advance made in White Cochins, and in point of popularity they run Buffs very close. There is still trouble in getting a pure-coloured cock, though occasionally one is shown with plumage white as the driven snow.

The following notes on breeding and exhibiting White Cochins are from a lady whose marriage has taken place since they were written, but who was, previous to that event, well known as their most prominent exhibitor under the name of Miss Edith Rouse, Lostwithiel, Cornwall:—

"This beautiful breed has many admirers, and nothing can be more pleasing to the eye than to see a flock of White Cochins on a lawn, with their brilliant red faces and combs, which look very lovely against the green grass.

"To start with, the first thing is the mating of the breeding pen. As colour is the leading feature, and that is influenced greatly by the cock bird, he should always be of a silvery white. In this I am very particular, not only as regards the bird himself, but to see that his father also came from birds very sound in colour. We must not forget that our sire, in order to breed birds to win, must have the ideal Cochin shape, with a very neat comb, and an abundance of feather. I am not so very particular about mere size in the cock, provided he is of the above stamp. For breeding early chickens I find nothing better than a cockerel, and should prefer one that has not been kept up for the show pen, but bred and kept for stock. But for my principal hatching I use a two-year-old cock, with my best typical hens.

"Respecting hens, I do not study colour so much, provided they are large, with plenty of feather. In the breeding pen, to secure strong healthy chickens, the pen should consist of not more than four hens in the early spring, and five later on, with one male bird. The breeding pen should be fed sparingly, otherwise the chicks will hatch out weak, and often die.

"My most successful broods have been hatched when the nest has been made of earth, just covered with a layer of hay on the ground.

"To prepare White Cochins for exhibition, they should be kept in a shaded run, and scrupulously clean, and a fortnight before being shown should be placed in a pen similar to an exhibition pen, only larger. Here they should be bountifully fed; and handle them often to make them familiar with the show pen, when they will show themselves to a great advantage.

"Two days before sending to the show the birds should be washed [see p. 215], finishing the neck and head last of all. Have another bath by your side with clean cold water, to which add a *little* blue. When the bird is properly washed, throw a little cold water over its head; then plunge it in the cold water (keeping its head above water), and properly rinse out all the soap from the feathers and place it on a small table; have a quantity of dry towels ready; then squeeze out all the water from the feathers with the towel, when one is wet taking a dry one; by this means you can wipe the bird nearly dry. Now place it in an exhibition pen, on a platform in front of a good fire—near enough but not too close—and if attended to it should be dry in two hours, but it will take quite twelve hours for it to fluff out quite perfect. I consider it will take about fifteen minutes to properly wash a bird that has been on a run."

The chief difficulty in breeding White Cochins is of course that of colour; and beyond that, the greatest desideratum at present is probably size. Thirty years ago there was a strain of Whites which had a well-known tendency to show a kind of reddish-sandy colour as a faint stain in the cocks' wings, quite distinct from that yellow tinge which is the more common fault; but this sandy strain seems to have died out or been bred out, for we have not seen it lately. The main point is to select birds which were not only white as chickens, but have moulted white, and kept white in moulting. The last test will probably prove too severe for any new strain, the great majority of cockerels showing yellow—what is called "sap" in the feathers—while the latter are growing out of the quills; but as soon as possible this crucial test should be applied, and the very few which do grow the young feathers white throughout, given the preference. When once this stage is reached there will be less trouble in regard to colour; but shade will always be necessary for the male birds as soon as the permanent plumage begins to appear. The late Mr. Elijah Smith, who wrote the notes on this variety for the first edition of the *Illustrated Book of Poultry*, was also very particular about the dusting material which he supplied: he found some sand and road-dust injure colour very much, and always carefully selected a pure white sand or sifted gravel, as was also done by a friend of ours who bred these fowls successfully at Bristol.

In regard to size, the White Cochin does not fall far behind the other colours. By selecting some big hens, with great wealth of feather, there is no reason why Whites should not be produced equal to the Buffs for size, while in shape they are well up to the standard. Much can be done by careful and regular feeding, and anyone wanting size must be prepared for early and late meals with the youngsters. To obtain purity of colour it is essential that the cock should be pure. Many successful breeders have tried a black hen in with the white cock, the idea being to get a dead white plumage; but the silvery feather so necessary will not come the first year, but from the second or third cross. The same result can be reached by sticking to the whites, but all coloured birds must be eliminated.

Other points of colour should receive a word or two. Orange or red eyes are greatly to be preferred in Whites, the pearl eye appearing in this variety to be even more prone to blindness than in the others. It is also rather unusually subject to a stain of white in ear-lobes, which should be carefully avoided: very slight cases may sometimes be cured by frequent friction, or a stimulant to the surface as described on p. 213. Bright yellow shanks should also receive attention, as pale shanks are apt in their turn to breed white ones, and the next stage may be that *green* tint which is fatal. Rich colour in the beak should accompany that in the shanks.

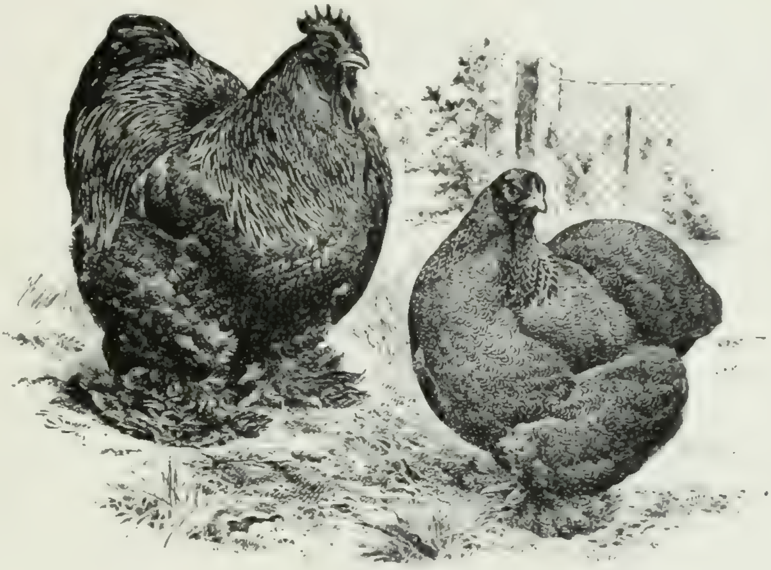
Cuckoo Cochins.

Cuckoo Cochins have now and then been shown, but have never met with favour. They were no doubt produced by a mixture of dark and white blood, which sooner or later always produces this colour, with a constant tendency to reproduce the black, or white, or coloured feathers which have been its components. To get rid of these foul feathers requires much care and skill in breeding, and the Cuckoo Cochin has never had sufficient admirers to make the attempt very successful. In fact the colour does not appear to suit the Cochin type very well, and has now become so identified with the Plymouth Rock. Were it ever to become popular, it would have to be bred in the same way as the barred Plymouth Rock in regard to colour, looking after Cochin points as usual. Most of the few we have seen have been deficient in these latter points, and unless the true Cochin character is predominant, then the colour must die a natural death. Though for years past the Cuckoo has been dormant, a pair was shown at one fixture during 1910, and should they have really fine Cochin character, they would probably win in the class for mixed colours now so common at many shows.

American Cochins.

Cochins in America were in 1900 bred to a perceptibly different type from that recognised in England, and the difference and its history are interesting. Up to about 1890 American breeders had adhered strictly to the older fashion of English birds, vulture-hocks being still rigorously disqualified, long after they had been tolerated at British shows. But about the year just mentioned, a pair of very heavily feathered Buff cocks were sent over by Mrs. Scriven to be exhibited at the New York Show. These birds were disqualified for their hocks, but were much admired for their grand appearance, and purchased by American breeders, others of the same type being also imported in consequence of the impression which these had made. These importations woke up quite a new interest in Buff Cochins, and for a couple of years there were separate classes for both the ordinary American type, and what were called the "full-feathered" birds. This stage was however only ephemeral, American breeders speedily setting themselves down to the problem of producing the heavy foot-feathering and full plumage generally, without the quilled vulture-hocks which in England have been the accompaniments of these points.

That they successfully solved this problem there is no doubt—so far at least as regards the best American breeders and their best birds. The choicest specimens amongst the Cochins exhibited by the brothers Sharp in Buffs, and Mr. Mitchell in Partridges, were pronounced by those who saw both to have been nearly if not quite equal to English Cochins in foot-feather, but entirely free from stiff quills about the hocks. There is not only ample testimony to this effect, but it is confirmed by the American method and canon of breeding, which has produced a type, if anything more globular than the English ideal, as will be seen from the accompanying illustration, which we take from the *Reliable Poultry Journal.* The genuine fluff of the thighs has been developed lower down, so as to cover the hocks and upper part of the shank-feather; and the breast plumage is also much increased towards the bottom, and is profuse and fluffy in character; and the result is, although the American and English standards are practically identical, a Cochin even more developed in total roundness of form, with the hollows and angles still more filled up, than in England, with the fluff further developed, and coming more down over the hocks and shanks towards the ground. We have already noticed the changes in this direction which have taken place here, but in the modern American type we find that change carried to its furthest degree.



American Partridge Cochins.

This model has been produced by systematic cultivation of what we may call "fluffy" plumage. Feathers differ greatly in the proportion of fluff to solid webbing, the Cochin having always been remarkable for weakness of quill, width with shortness of web, and ample fluff. Americans have systematically developed these points, until one or two breeders now express as their opinion and practice that, so far as possible, stock should be selected in which the body feathers possess only about one-fourth of their length in solid webbing, the remaining three-fourths being loose fibrils or "fluff." At all events they select birds in which that is the main character of the plumage, and by this course, and the rejection of stiff quills, they have succeeded in banishing vulture-hocks, while yet retaining heavy foot-feather, which is unquestionably a very great achievement in breeding.

It is worthy of remark that years ago there would appear now and then, in strains of Buff Cochins, specimens in which all the feathers consisted of loose fibrils, resembling those figured later in these pages, of the Silky fowl. We have seen none now for many years, but they were mentioned as far back as 1853, and at one time were known as Emu or Silky Cochins, but were considered delicate, as well as difficult to keep in nice order. This *entire* "silkiness" of feather is the extreme limit, perhaps, of the kind of plumage which American breeders have sought to develop to the extent above stated, with the result of so much increasing the fluffiness and apparent bulk of their birds. We have it on good authority from several sources that the best specimens at the chief shows do exceed considerably, in this fluffiness of plumage, any English stock that has so far been imported.

As regards colours, in America the taste is now for "rich golden buff" in Buffs; but in Partridges there is a considerable difference from English fashion. American Partridges are often most beautifully pencilled, and show beautiful Cochin development as described above. The pencilling extends all the way down the feather, clean, clear, and distinct, and in this they are far ahead of the English variety, but in the matter of colour the two form a striking contrast. While our own is a light and dark shade of brown, the American bird is of a rich mahogany-red colour and the pencilling rather coarse. The cocks are alike in breast and feet, but the top colour is more ruddy and nearly uniform in America.

As regards the Black and White varieties, it is interesting to observe that in the former, whereas the English standard allows the eyes to be bright red, dark red, hazel, or nearly black, the American Poultry Association insists on a black or dark brown eye, and that the under-colour of the plumage must be black to the skin. Further, while we require "lizard" legs, black gradually shading into yellow is preferred in the States; but the bottoms of the feet must be yellow. In the White variety, practically the only difference is that while we insist on pearl or bright red eyes, in America reddish-bay is the correct colour.

The bodily characteristics of Cochins require some special care in rearing and management. They are above all breeds prone to lay on fat, both externally and internally: hence maize should be carefully avoided for them, and a most careful watch kept upon too great weight, or signs of laziness. When kept in confinement they require even more than other fowls to be regularly and plentifully supplied with green food: if this is not attended to they are peculiarly apt to suffer from liver disease in some form, though in other respects the breed must be classed as hardy. The same ample supply of green food has much to do with the successful rearing of chickens, keeping the system in a healthy growing state, and preventing premature deposit of fat. Over-crowding is perhaps more prejudicial in rearing chickens of this breed than almost any other, and wasters should therefore be picked out early; there will always be sufficient even as regards Cochin character and plumage, independent of faults in colour.

The plumage naturally requires great care to preserve it in good condition, owing to its profuse and soft character, which makes it easily injured. More than in any other breed, pullets intended for show should therefore be separated in good time from the cockerels. So in regard to washing, while we have already said that as a rule it is little matter how or in what direction feathers are rubbed about, a little care not to rub violently too much against the lie of the feather is advisable in the case of Cochins, the feather being so much weaker than in other breeds. To preserve foot-feather, the bird must never be allowed to run in long or stubbly grass, which rapidly wears down the lower plumes. A grass-run for Cochins meant to be exhibited should be mown and kept like a lawn, short and tender. Neither should they be allowed to scratch much amongst long straw, a course which cleans many other fowls so admirably, but which tends to injure heavy foot-feather by friction.

One of the most tiresome difficulties in Cochin breeding is the propensity to "loose" or "slipped" wings, a propensity more common in them than in Brahmas, which also share it, owing to the greater softness of the plumage. The very first birds imported showed this so strongly, that some of the newspapers of the time described such wings as a peculiar formation, enabling the bird to "double-up" and fold its wing in a peculiar manner. It is strongly hereditary, and should, therefore, be sedulously guarded against in breeding stock; if this be done, individual cases can often be cured as described on p. 210. But special care should be taken of any unusually promising cockerel, that he be not driven about or flurried, which we are quite certain has often started this blemish at a critical age.

Qualities of Cochins.

From a utility point of view it cannot be denied that Cochins have deteriorated: but they still have useful qualities in their size, hardiness, and capacity for winter laying, which some strains have never lost. The great size of the drumstick and deficiency in breast detracts of course from their table value; yet we have had cockerels pronounced "delicious," and not without reason, the large drumsticks being much more juicy than in an ordinary fowl. The small space in which they can be kept, and the little fencing which will confine them, would make them, with all their faults, very suitable for many small yards, were it not for two serious drawbacks, in the crow of the cocks and the constant broodiness of the hens, which often want to sit after laying a dozen to twenty eggs. This could of course be bred out by selection, but is not worth that trouble when so many breeds with less of it already exist; and such a quality almost disqualifies the breed for many of the small runs where it would otherwise be most suitable. It does not answer to deny such a strong instinct altogether, and the best plan is to "dodge" it by letting one hen hatch the eggs, and by removing one or two when nearly hatched, to a second, get her to take to the other chicks when all are out, thus letting one brood satisfy and rest two hens. Cochins are so tame and affectionate and easily cheated that this can nearly always be done with them, as it could not be with other fowls. Any birds thus kept for utility will probably be far less furnished with fluff and foot-feather than is necessary for exhibition stock, and will on that account be generally found more profitable.

Their size and hardihood make Cochins even yet of some value as a cross, provided care and judgment are used: without that the result is ruin. Cochins were turned down on farms all over the country in the days of the "mania," the progeny being a lot of scraggy, coarse, long-legged mongrels which did the chicken industry distinct harm. With good Dorking hens the cross produces rather coarse but large and useful fowls, which any housekeeper is glad to buy, though the Brahma is certainly better still. The cross between a really short-legged Cochin and the Crêve is finer in bone, and very good indeed. The Houdan cross is also well spoken of by those who have tried it. On the other hand, our notes in Chapter VII. have already shown how even the disastrous primary cross of the Cochin on local fowls, when further overpowered and tempered down by further crosses of the local blood, has entered into some of the most useful stock of table poultry in the country.

The Cochin has, however, had far more marked influence as one of the progenitors, the real foundation, of quite a group of other breeds, which owe to it size, hardihood, yellow legs, and in many cases buff or other plumage. We should have known nothing of Plymouth Rocks, Lincolnshire Buffs or Buff Orpingtons, and Wyandottes, but for the Cochin, to say nothing of such American varieties as Rhode Island Reds, Danvers Whites, and others, which may or may not achieve some day a wider popularity. If he is himself less popular than formerly, he has cut his mark deep in the poultry world even of the present day.

Judging of Cochins.

The judging of Cochins has altered a great deal since the breed was first introduced, most of all in regard to shank-feather. At first a very moderate amount of a rather soft character satisfied fanciers and judges; and for years after more began to be sought, vulture-hocks were practically disqualified, though not avowedly so. So many birds were then shown with plucked hocks, that as a lesser evil toleration crept in, and hocks sometimes mean little detriment at English shows. Personally we agree with the description in the latest edition of the Poultry Club Standards—"as free as possible from any stiff quills (vulture-hocks)"—since stiff quills, except in wings and tail, are inconsistent with the fundamental Cochin *idea* of soft plumage.

The chief points which require vigilance as regards trimming and faking are tails, wings, and "fluffing." Tails are sometimes plucked because too long, sometimes because of feathers the wrong colour—especially white feathers. Wings are sometimes plucked to get rid of twisted feathers, which occur oftener in Cochins than in any other breed. And after the case alluded to in our last chapter, it is certainly as well just to see whether any artificial amount of fluff has been imparted by ingenious tampering of the kind referred to.

The Poultry Club Standard of Perfection for Cochins is as follows:

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Small. *Beak:* Curved, short, stout at the base. *Eyes:* Expressive. *Comb:* Single, upright, neatly arched, perfectly straight, free from excrescences, of fine texture, and symmetrically notched or serrated. *Wattles:* Long, thin, and pendant. *Ear-lobes:* Sufficiently developed to hang nearly or quite as low as the wattles.

Neck.—Rather short and carried somewhat forward, thickly furnished with hackle, which should flow gracefully over the shoulders.

Body.—Large and deep. *Back:* Broad but very short. *Saddle:* Broad and large, with a gradual and decided rise towards the tail, forming a harmonious line with that member. *Wings:* Small, closely clipped up, the flights being neatly and entirely tucked under the secondaries. *Breast:* Broad and full, coming as low as possible.

Tail.—Small and soft, with as little hard quill as possible, and carried low or nearly flat.

Legs and Feet.—*Thighs:* Large, and thickly covered with fluffy feathers standing out in a globular form. *Hocks:* Nicely and entirely covered with soft, curling feathers, but as free as possible from any stiff quills (vulture hocks). *Shanks:* Short and thick, wide apart, and heavily feathered down the outside, the feathering to start out well from the very hock, and continue to the ends of the middle and outer toes. *Toes:* Four, large, straight, and well spread.

Carriage.—Rather forward, high at the stern, and dignified.

Weight.—From 10 lb. to 13 lb.; cockerel from 8 lb. to 11 lb.

HEN

Head.—*Skull:* Very small. *Beak:* As in the cock. *Comb and Wattles:* Also similar, but as small as possible, the comb being uniformly serrated. *Ear-lobes:* Well developed, but smaller than those of the cock.

Neck.—As short as possible, carried well forward, and thickly furnished with hackle.

Body.—Large, [illegible] in appearance than that of the cock, the shoulders being rather more prominent *Back:* Very flat, wide, and short. *Cushion:* Exceedingly broad, full, and convex, rising from as far forward as possible and almost burying the tail. *Wings:* As in the cock, but smaller in proportion, the points being nearly buried in the abundant body-feathering. *Breast:* Full, the keel as low as possible.

Tail.—Very small, carried almost horizontally, and nearly buried in the cushion.

Legs and Feet.—As in the cock.

Carriage.—Tending forward, high at the cushion, and with a very matronly appearance.

Weight.—From 9 lb. to 11 lb.; pullet, 7 lb. to 9 lb.

COLOUR

THE BLACK

Beak: Yellow, horn, or black. *Comb, Face, etc.:* As in the Buff. (The comb in black Cochins has a great tendency to be rough, but this is to be avoided.) *Eyes:* Bright red, dark red, hazel, or nearly black. *Legs:* Lizard.

Plumage.—A rich black, well glossed (dull black very objectionable) and free from golden or red feathers.

THE LEMON-BUFF, SILVER-BUFF, OR CINNAMON

Beak: Rich yellow. *Comb, Face, Ear-lobes, and Wattles:* Bright red. *Eyes:* To match the plumage as nearly as possible. White or pearl eyes are admired by many, but are very apt to become blind. Red is preferable to any colour, as it denotes greater vigour of constitution; but red eyes in Buffs are very rare. *Legs:* Yellow, and fading in old birds, with a shade of red between the scales.

Plumage of the Cock.—*Breast and Under-parts:* Any shade of lemon-buff, silver-buff, or cinnamon, provided it be even, and free from mottling. *Neck-hackle, Back, Shoulders, Wings, and Saddle:* Any shade of deeper and richer colour which harmonises well—lemon, gold, orange, or cinnamon—the wings to be of perfectly sound colour, and free from mealiness. *Tail:* Of a still darker tint, but as free from black as possible; white in the tail is very objectionable in any colour except the White variety.

Plumage of the Hen.—*Body:* All over an even shade, free from mottled appearance. *Hackle:* A deeper colour to harmonise, free from black pencilling or cloudiness, cloudy hackles being especially objectionable. *Tail:* As free from black feathers as possible. Birds must match in the same pen, and in matching different sexes the hen's body colour must match that on the cock's breast and lower parts.

THE CUCKOO

Beak: Rich bright yellow, but horn-colour permissible. *Comb, Wattles, etc.:* As in the Buff. *Eyes:* Bright red. *Legs:* Brilliant yellow.

Plumage.—Ground-colour of blue grey, barred or pencilled across with bands of dark blue grey; the cock's hackle to be as free from a golden or red tinge as possible, and his tail free from either black or white feathers.

THE PARTRIDGE OR GROUSE

Beak: Yellow or horn colour. *Comb, Wattles, etc.:* As in the Buff. *Eyes:* Bright red. *Legs:* Yellow, of a dusky shade.

Plumage of the Cock.—*Hackle:* Rich bright red or orange red, with a dense black stripe in each feather. *Back, Shoulder-coverts, and Wing-bow:* Rich red, of a more decided and darker shade than the hackle. *Wing-coverts:* Metallic green-black, forming a wide and sharply-cut bar across the wing. Secondaries, rich bay on outside web, which is all that appears when the wing is closed; black on the inside web; end of every feather black. Primaries, very dark bay on outside, dark on inside web. *Saddle:* Rich red or orange red, either same colour as (or one shade lighter than) the hackle. *Breast, Under-parts, Thighs, and Leg-feathers:* Glossy black, as intense as possible. *Tail:* Black, richly glossed; white in the tail not a disqualification, but very objectionable.

Plumage of the Hen.—*Hackle:* Bright gold, rich gold, or orange gold, with a broad black stripe in each feather, the marking extending well over the crown of the head. *Remainder of Plumage:* Brown ground-colour distinctly pencilled in a crescent form with rich dark brown or black, the pencilling being perfect and solid up to the throat, the leg-feather to be pencilled as the body.

THE WHITE

Beak: Rich bright yellow. *Comb, Face, etc.:* As in the Buff. *Eyes:* Pearl or bright red. *Legs:* Yellow.

Plumage.—Pure white, free from any straw or red shade, or ticking of black or buff. The cock will often show a straw tinge on his upper parts, but this is to be avoided as far as possible.

SCALE OF POINTS

Colour, or marking in Partridge or Cuckoo	20
Size	15
General symmetry	10
Leg feather	10
Head	10
Cushion	8
Fluff	7
Tail	5
Hackle	5
Ear-lobes	5
Condition	5
	100

Serious defects: Primary wing feathers twisted on their axis—"slipped" wing, the primaries being outside the wing is objectionable, but cannot be considered as a sufficiently serious defect to cause a bird to be entirely thrown out of competition; utter absence of leg-feathers; legs of any colour than yellow or flesh, except in Blacks, which may be black; white or black feathers in Cuckoos; badly twisted or falling combs; crooked backs, wry tails, or any other actual deformity.

CHAPTER XVI.

BRAHMAS.

Origin of Brahmas.

THERE never has, perhaps, been such long and acrimonious discussion upon any poultry subject as upon the origin of this breed of fowls, and there never was so little real reason for any at all, or more practical certainty about the facts, as established by all the really respectable evidence. This proves the Brahma to be quite one of the earliest imported of the feathered Asiatic races, having, in fact, been introduced into America in the very same year that Cochins were imported into England. The controversy is now closed, and it will not be necessary to recapitulate it at such length as was imperative in the second and subsequent editions of the former *Illustrated Book of Poultry*, which had the effect of placing the facts beyond any further doubt, or even disputation. At this date, therefore, a brief summary will suffice.

In a letter to Dr. J. C. Bennett, dated March 2nd, 1852, Mr. Virgil Cornish, of Connecticut, gave the following account of these birds:—

> In regard to the history of these fowls very little is known. A mechanic by the name of Chamberlain, in this city, first brought them here. Mr. Chamberlain was acquainted with a sailor, who informed him that there were three pairs of large imported fowls in New York; and he dwelt so much upon the enormous size of these fowls that Mr. Chamberlain furnished him with money, and directed him to go to New York and purchase a pair of them for him, which he did. The sailor reported that he found one pair of light grey ones, which he purchased; the second pair were dark coloured, and the third pair were red. The man in New York, whose name I have not got, gave no account of their origin, except that they had been brought there by some sailors in the Indian ships. The parties through whose hands the fowls came, so far as I have been able to trace them, are all obscure men. I obtained my stock from the original pair brought here by Mr. Chamberlain, and have never crossed them in the least. These fowls were named Chittagong by Mr. Chamberlain, on account of their resemblance, *in some degree*, to the fowls then in the country called by that name; but it is certain that they never bred until they reached this town.

A valued American correspondent, Colonel Mason C. Weld, then associate-editor of the *American Agriculturist*, forwarded for us to Mr. Cornish a series of questions on the subject, and transmitted to us that gentleman's reply, as follows:—

> NEW BRITAIN, CONNECTICUT, U.S.,
> *November 9th*, 1869.
>
> MASON C. WELD, ESQ.
>
> DEAR SIR,—I have your letter of 5th. I give below all the facts relating to the early history of the Brahma-Pootra fowls I can call to mind at this late day. At an earlier day I could have given a history of these fowls more satisfactory to myself, *i.e.* more fully than I can now; nevertheless, so far as it goes, the truth of it cannot be questioned. I will at once answer your questions.
>
> 1st.—Mr. Chamberlain's Christian name is Nelson H.
>
> 2nd.—The sailor's name I never made note of, and cannot give it.
>
> 3rd.—The ship arrived in New York in September, 1846. The first brood came out in May, 1847. I purchased the most of that brood in August, and the old pair the April following.
>
> 4th.—The name of the port from which the ship sailed with the fowls on board is Luckipoor. This port is up from the mouth of the Brahma-Pootra river, in India. The name of the ship I cannot give, neither can I give the name of the captain. Did not at the time think it of importance, and made no record of it.
>
> 5th.—The Brahmas were first exhibited in Boston by Mr. Hatch, of Hampton, Conn., under the name of Grey Chittagongs, in 1850. I declined exhibiting mine at that time; I believed them to be a breed different from the Chittagong, and preferred to accumulate stock and test them further before bringing them out publicly.
>
> 6th.—I attended the exhibition at Boston, and contended that they differed from the Chittagongs, and should pass under a different name. A committee was appointed, and the name Brahma-Pootra given; it being the name of the great river from the banks of which they came. The name was then established.
>
> 7th.—Weight of cocks, full-sized, twelve to fourteen pounds; cocks, six to seven months, nine to ten pounds. Hens when first introduced, nine to ten pounds.
>
> 8th.—I did notice the "pea-comb" on the first birds. It was small. It was not so with all, and yet it appeared different from the comb of the Chittagong.
>
> 9th.—There was no degeneracy in the birds of my breeding. I had some specimens larger than the imported birds. I sold no birds until December, 1850. I sold at first at twelve dollars per pair, and soon after from fifteen dollars to fifty dollars per pair. The price went up as the fowls became better known, and recognised as a distinct breed.
>
> 10th.—I bred them eight years, when my health failed, and I was obliged to leave all care for a time.
>
> 11th.—There was a tendency to throw dark chickens,

but a greater tendency to become lighter, and yet not white like the White Dorking. All breeds of fowls having dark and light feathers can be varied either way, to darker or lighter, by choosing always the darkest or the lightest for breeders. If your stock of Brahmas are pure, and they are allowed to breed together promiscuously, the variation in colour will be slight. I never bred to either extreme.

Yours truly, VIRGIL CORNISH.

The most important point in relation to this testimony is, of course, the position and trustworthiness of Mr. Cornish; concerning which we will quote part of another letter from him to ourselves, dated April 12th, 1870, but we ought to add that we carefully verified its statements from independent sources:—

> As my name has appeared in this country and in England in connection with the history of the Brahmas, I beg you to allow me a word for myself.
>
> My letters to Dr. Bennett and others, from which you make extracts, were called for, written, and published at an early day, when the parties who brought them (the Brahmas) from India to New York, and from thence to Hartford, Connecticut, were *living and to be seen* by all men. They *were* often seen and inquired of by parties interested, and their statements were never discredited, nor doubted by anyone except Mr. Burnham, and by him only by falsely stating that he originated them in his own yard.
>
> At the time the original pair of Brahmas were brought to Hartford, Connecticut, I was an officer at the Retreat for the Insane in that city; having in charge all the business of that Institution, except that which belonged strictly to the medical department. I had purchased a farm of fifty acres for the institution, and thereon fitted up a large yard for the accommodation of rare animals, flowers, and birds; and had placed in them more than *sixty* distinct breeds (of fowls and other animals), in which I took much interest and pleasure. This I had done for the amusement of our convalescent patients. I had no pecuniary interest in bringing out the Brahma fowls, but saw at once that they were a distinct breed, and worthy of a high place.

As far as any record has been preserved, these birds were first shown at Fitchburg, Connecticut, in 1850, under the name of Grey Chittagongs, by Mr. Hatch, who had purchased stock of Cornish; Dr. Bennett, at the same time, exhibiting some cross-bred birds from Chittagongs, which he called Burram-pooters. He liked Mr. Hatch's birds so much better than his own crosses, that he dropped the latter, bought birds from both Mr. Hatch and Mr. Cornish direct, and thenceforth "boomed" the new stock for all he was worth under the name of Brahma-Pootras, speedily contracted to Brahmas. All the early exhibitors belonged to Connecticut, which, of itself, corroborates their direct testimony that this State was the head-quarters and centre of the new breed, and that all were from Mr. Cornish's stock.

Against this uniformly consistent testimony there never was any protest except that of the most notorious charlatan ever known in the American poultry world, who did not receive any credence amongst respectable authorities until Mr. Tegetmeier, in his *Poultry Book*, rashly endorsed him as follows:—

> Those who maintain this theory say they originally came from Luckipoor, a port on the Brahma-Pootra river, but they have forgotten alike the name of the ship, that of the captain, and also that of the sailor who brought them over. It is also acknowledged that they were first exhibited in Boston under the name of Grey Chittagongs in 1850. There is not a particle of evidence to show that they came from India.* . . . In fact, Brahmas originated not in India but in America, and the two varieties of the breed now known as Dark and Light Brahmas, had unquestionably very distinct origins.
>
> The light Brahmas undoubtedly originated in or were identical with, those grey birds that from the very first importation came over from Shanghae with the buff and partridge birds now universally known as Cochins. But public attention was first called to them in consequence of an acute American fancier, Mr. George Burnham, presenting a consignment to her Majesty. . . . Of the origin of these birds it will be best to let Mr. Burnham tell his own tale. In his amusing and unscrupulous work, entitled, *A History of the Hen Fever*, published at Boston in 1855, he says: "An ambitious sea captain arrived at New York from Shanghae, bringing with him about a hundred [!] China fowls of all colours, grades, and proportions. Out of this lot I selected a few grey birds that were very large, and consequently very fine. I bred these with other grey stock I had, at once, and soon had a fine lot of birds to dispose of, to which I gave what I have always deemed their only true and appropriate title (as they came from Shanghae) to wit, *Grey Shanghaes*. In 1851 and '52 I had a most excellent run of luck with these birds. I distributed them all over the country, and obtained very fair prices for them; and finally the idea occurred to me that a present of a few of the choicest of these birds to the Queen of England wouldn't prove a bad advertisement for me in this line."
>
> . . . The origin of the Light birds has already been given. Of the Dark breeds, Mr. Burnham states that they were grey Chittagongs crossed with Cochins. "Of this," he says, "no one now entertains a doubt: they were the identical fowls all over—size, plumage, and characteristics."

Unfortunately the late Mr. Charles Darwin, who in one or two other cases also has somewhat too rashly adopted statements from the same quarter, received without doubt or question Mr. Tegetmeier's view of this case, and wrote † that "Dark Brahmas, which are believed by some fanciers to constitute a distinct breed, were undoubtedly formed in the United States within a recent period by a cross between Chittagongs and Cochins." Such scientific endorsement of the mere unscrupulous self-advertisement of a foreign poultry dealer necessitated correction, and in the very first edition of the *Illustrated Book of Poultry*, from such material as was then available, we presented sufficient reason for concluding that Burnham's claims could not be regarded as truthful statements, and were perhaps not even meant as such. To have gone further then (as we could have done even from material then in our hands) would have seemed ungenerous, as we did not know that any parties to the old American controversy of 1850–55 were still alive. But Mr. Burnham made the fact that he was very much so, speedily evident by a series of letters in all the poultry journals of America, during many months of 1874, which he got together and reprinted in a book called *The China Fowl* * dated the same year, the style and tone of which will be sufficiently shown by the following brief specimens:

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* Mr. Tegetmeier seems not to have noticed that even Chittagong also is an *Indian* name.

† *Variation of Animals and Plants under Domestication.*

The Final Controversy.

> I repeat it: I was utterly ignorant of the virulence, the total falsity, the bitter misrepresentations, the carping, silly, unwarrantable language you had adopted towards me in your two books [the *Brahma Fowl* and the *Illustrated Book of Poultry* are here referred to] until the last few weeks, when I, for the first time, had access to these ignorantly composed and miserably spirited volumes! Wherein have I ever offended *you*, that you should thus in your books blackguard, malign, vilify, and prate like a hen with a sore head about *Burnham* this, and *Burnham* that? I am a gentleman, sir, by nature, education, fortune; and *never* did a human being wrong, so help me God, to my knowledge, in my life.
>
> When *you*—3,000 miles away—undertake to commingle and involve *me* in this cursed, obnoxious, Burrampooter, Brahma-pootra, Burmah-pater, Bahama-poodra, sailor, Cornish, Chamberlain, Bennett, Hatch, Wright, Plaisted, Knox, balderdash — I protest, . . . and shall endeavour, in my own way, to answer and refute your infamous and spiteful tirade against me. Before I get through I have no doubt I will succeed in impressing upon Mr. Lewis Wright, of England, if upon no one else, that that gentleman had much better have informed himself of the *facts* in this case, ere he so maliciously and so stupidly ventured to assail and malign the undersigned.
>
> I should say you penned these sentences with the Fiend at your elbow.

As Mr. Burnham had this all to himself for many weeks, it is not surprising that for a short space of time it produced some impression. One gentleman wrote about the "little onpleasant difference, which B. so far seems," he said, "to have the best of"; and another, "the personal strictures in that lengthy extract upon Mr. Burnham [from first edition, *Illustrated Book of Poultry*] I think are highly prejudiced, as well as unwarranted"; while others adopted his arguments in detail, one paper openly exulting over the spirited way in which the American was "standing up to the Britisher." It was this which necessitated a more thorough dealing with the matter, with the aid of much more ample evidence then in our hands. This time the result was final. Without of course imitating the style of the above quotations, by a series of contemporary extracts the whole of Burnham's statements were so demolished that no one has since ever attached the slightest credence to them, and the result in America itself, where he had been permitted his full fling of statement and abuse, may be summed up in the later comment of one of the same papers cited above for its earlier impression, that "Burnham had much better not have gone upon the war-path, since the only result has been that the Englishman returned from it with the scalp of the other hanging to his girdle." The Cornish account has ever since been thoroughly accepted, in America as well as in England, as the true history of at least the Light Brahma.

This being so, we need only now very briefly summarise the points and the results of that direct controversy between Burnham and ourselves.† He began with long statements to the effect that he never in those earlier days had used the name of Brahmas, or ever referred to them by that name at all; and with further denials that he had ever had any controversy with Dr. J. C. Bennett or with Mr. Cornish, or ever had any of their fowls, though he said he had *better* ones; the whole when put together boldly asserting that he had his own distinct birds, which he never put in comparison with the others, and that he had let the other party go on their way with theirs. This was met by ample quotations from contemporary papers, and letters in our possession also of that old time, showing that Burnham was in hot and bitter controversy with Dr. Bennett and Mr. Cornish over both the name and the fowls; that he always averred their fowls were the same as his own, and derived from his, and were grey Shanghaes; and that he had himself often used the name of Brahmas, before we had done so at all. After that had been exposed, Burnham threw off any mask, and coolly stated concerning Dr. Bennett and the sailor story—Dr. Bennett having been many years in his grave—that "Dr. John C. Bennett *coined* this sailor's yarn originally, and the others tacitly agreed to it. The fowls were from my yards or out of my stock; and Bennett never denied this in America, or England, for he couldn't" (*China Fowl*, p. 114). On a later page he reiterates how Dr. Bennett had shown him this "prepared account" months before; and once again he asserts how Dr. Bennett had practically *forged* the entire account. In reply to this we cited reiterated statements by Dr. Bennett to the direct contrary; while Burnham had never dared to say in his lifetime, what he ventured upon now he was dead. But more occurred in America itself; for the discussion brought out Mr. C. Plaisted, Dr. Bennett's old partner, who professed to correct certain "errors" both in Cornish and Bennett, while confirming their narratives as a whole; but only succeeded in showing that they *might* possibly be one year out in some of their dates, they being however proved right and himself wrong in one alleged case by almost contemporary documents which were better evidence than Plaisted's mere memory a quarter of a century later. It also brought out the very man who had bought the fowls in New York—a Mr. Knox, who turned out to be not a "sailor" but a sort of ship-clerk—who added his evidence. And finally we received, and possess still, quite a bundle of letters from Mr. C. Plaisted and Dr. Bennett to Miss Watts, the editor of the English *Poultry Chronicle*, most of which are still unpublished, containing ample evidence to the same effect, and showing how they had combated Burnham's statements from first to last, and all along the line.

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* This curious production is in the possession of the Poultry Club.

† For fuller details, see *Illustrated Book of Poultry*, second and subsequent editions; and still more fully, a series of articles in the *Fancier's Gazette*, 1874-75.

But it also appeared that Burnham had been breeding birds of his own, quite distinct from the others, from either grey Shanghaes or from grey "Chittagongs" so-called, and an important question arose of how they stood related to the others. Mr. Burnham alleged that *his* birds, sent to the Queen as above, were the first sent to England, and were, as stated in a letter by Dr. Gwynne, "admitted by Dr. Bennett to be precisely similar to his own." He manipulated Dr. Gwynne's statement so as to read that Dr. Bennett had admitted *Burnham's* stock to be precisely similar to his; but we discovered and proved by ample evidence, that what Dr. Bennett always alleged was the fact that those sent to the Queen were birds not of Burnham's own, but of the Cornish strain, purchased from Mr. George Smith of Rhode Island. Bennett gave plenty of evidence of this in letters above alluded to, which we cited; but we also proved from Burnham's own statements in a paper which he edited in 1853, that (on his own showing) he had purchased from Rhode Island two pens for Lord Northby; and later that the Queen's birds "were from the same stock as those lately sent to Lord Northby." They were not the first sent to England, Dr. Bennett himself having sent over a pen to Mrs. Hosier Williams previously; but they had great influence in spreading the breed, being exhibited by Prince Albert soon after their arrival; and this proof of their real origin is therefore of considerable historical importance.

Still there is no doubt at all that Burnham did breed and exhibit birds of his own, and that he had some at the Fitchburg show of 1850: the only remaining point of importance is to disentangle the separate exhibits at this exhibition. About that there is no difficulty. Burnham alleged that Dr. Bennett's "Brahmas" were bred from a grey Chittagong cock bought from Dr. Kerr. Dr. Bennett always admitted that those he showed at Fitchburg in 1850 were so bred, and shown as Burram-pooters; but he always denied that he bred them after that: he then dropped them in favour of the Hatch stock, which had been bought from Cornish, and which he thought infinitely better. That Bennett and Burnham were both trying to "boom" poultry against each other, is perfectly clear; and it was to further this self-advertisement that the latter affirmed that all the Brahmas came from his stock, and that his was the original. The following sentences will settle all these points clearly:—

> At the Fitchburg Depôt Show in 1850, my original "Grey Chittagongs" [already described] were in the possession of G. W. George, Esq., of Haverhill, to whom they had been sold by the party to whom I had previously sold them. Nobody thought well of them; but they took a first prize there, and the "Chittagongs" (so entered at the same time) of Mr. Hatch, of Connecticut, also took a prize. My friend the Doctor then insisted that these were *also* "Burram-pooters"; but, as nobody but himself could pronounce this jaw-cracking name, it was taken little notice of at that time.
>
> Mr. Hatch had a large quantity of the Greys at this show, which sold readily at $12 to $20 the pair; and immediately after this exhibition the demand for "Grey Chittagongs" was very active. I watched the current of the stream, and I beheld with earnest sympathy the now alarming symptoms of the fever. "The people" had suffered a relapse in the disease, and the ravages now promised to become frightful—for a time!
>
> An ambitious sea captain arrived at New York from Shanghae, bringing with him about a hundred China fowls, of all colours, grades, and proportions. Out of this lot I selected a few *grey* birds, that were very large, and (consequently) "very fine," of course. I bred these, with other grey stock I had, at once, and soon had a fine lot of birds to dispose of—to which I gave what I have always deemed their only true and appropriate title (as they came from Shanghae)—to wit, Grey Shanghaes.—*Hen Fever*, date 1855.

Burnham alleges that he fought against the claims and the name of Brahmas, because he always objected to the "needless multiplication" of either breeds or names. It was felt that some reason had to be given, and this was the one given: it appears rather curious in the light of the following, from his own pen (*Hen Fever*, p. 274). A gentleman wrote him in these words:—

> I have read much on this subject of poultry, and I want to *begin* right, you perceive. I have made up my mind that there are not so many *varieties* of fowls extant as many breeders describe. I am satisfied that these domestic birds hail originally from China, and that *all* of them are of one blood. What is your opinion?
>
> Write me your views, please, and let me know if you can furnish me with what I seek, upon honour, bearing in mind that I am ready to pay your price, whatever it may be, but that I want only pure-blooded stock.

What followed is best described in his own words:—

> I informed my correspondent that I agreed with him in the ideas he had advanced, precisely (I usually did agree with such gentlemen), and I entertained no doubt that he was entirely correct in his views as to the origin of domestic fowls, of which he evidently knew so much. (This helped me amazingly.) I pointed out to him the distinction that existed (without a difference) between a "Shanghae" and a "Cochin China," and finally concluded my learned and *un*selfish appeal by hinting (barely *hinting*) to him that I felt certain *he* was the best judge of the facts in the case, and I would only *suggest* that, so far as my experience went, there were in reality but *ten* varieties of *pure*-bred fowls known to ornithologists (I was one of this latter class), and that these ten varieties were the *Cochins*, the White, Grey, Dominique, Buff, Yellow, Red, Brown, Bronze, and Black *Shanghaes*—and these were the only kinds *I* ever bred.
>
> As to their purity of blood, I could only say that I imported the original stock myself, and "enclosed" he had their *portraits*, to which I referred with pride and confidence and pleasure, etc. etc.

He then quotes the letter he received in reply, of which it is only necessary to state that it ordered six chickens of each of the varieties he had named. The fulfilment of the order he relates as follows:—

> I sent this anxious purchaser sixty chickens, at ten dollars each (cheap enough, to be sure), in accordance with his directions, and he was delighted with them. I do not *now* entertain a shadow of doubt that every *one* of those ten "different varieties" was bred from white hens and a black cock, one of the ordinary "Shanghae" tribe.

That was not quite the last, however, of this transaction. In the renewed controversy of 1874 an American fancier roundly taxed Mr. Burnham with the affair: and he might possibly have rejoined that he wrote it to amuse, or invented it, or exaggerated it. He did nothing of that kind, but replied as follows:—

> I said I had no doubt of this. I have not now. Those white, light-coloured, and black imported Shanghaes of mine produced all sorts of colours in my hands—in breeding. Could I help that? I imported the birds at heavy cost, and did the best I could with them. In those years we had not got this thing down so fine as you and I have in these later days of improvement in poultry-raising. Where exists the harm or the deceit in this confession, pray? I sent my customers what they wanted to buy; and bred all colours very frequently from the very same birds, in those days, as everyone else did. And we did not know any better. Bless you, Mr. Athole, this was but the commonest result everywhere. It did not change the purity of the *blood*, but simply the *colour*.

If this were so, he surely might have swallowed the Brahma also, name and all, and admitted one more "pure breed." And it would be also somewhat like a miracle that if his "Shanghaes" bred like that, just one lot of birds which he says were bred *from these same Shanghaes* should have bred with the uniformity of colour and purity of race which he too always claimed for this *one* variety, the Brahma. But it was not so. The very same book records a conversation between himself and Dr. Bennett, who had been relating his production of "new varieties" by crossing; and that he clearly pointed out to the doctor how impossible it was to avoid chance results from mixing varieties. He did know better, and was fully aware of the results of crossing colours, and had described these birds as "pure bred," knowing they were not so; and he had further described Cochins as *different* from Shanghaes, yet sent Cochins from the same stock. Honest breeders found differences, and curious results, in the produce of early Cochins, as recorded in the preceding chapter, but they did not find their stock vary in this extraordinary way: Sturgeon and Punchard, and Fairlie, and others did not breed "all" colours from the same stock: but then neither did they advertise "ten varieties of pure-bred fowls" all from the same, nor mate white with black in order to produce them.

To go back however to the Fitchburg Show; so far from the Burnham stock being either the first, or the best, we have it above under his own hand that "no one thought well" of either Dr. Bennett's original cross-made birds, or of his own shown by Mr. George; but that the third stock—Mr. Hatch's—which came from Cornish, "sold readily" at good prices, and at once created an active demand for "Grey Chittagongs," under which name they were entered. It is also proved that it was *seeing this Hatch stock*, and its success, that gave Burnham the idea of himself breeding Greys, which he only began after seeing them at that show; that he then bred them and sold them in imitation of the Chamberlain strain; but that when he wanted really fine birds to send to the Queen, he had recourse to a stock of that strain itself in the possession of Mr. Smith, of Rhode Island.

There are many independent testimonies to the effect that Hatch called his birds "Chittagongs" because they were grey and had some resemblance so far to fowls already known by that name in America, with evident Malay blood in them; but the same testimonies make it clear that these original Chittagongs, or at least their crossed produce, were of an "owl" colour as described, probably what we now know as cuckoo or barred, whilst the Hatch stock was mainly cream-white, with pencilled hackles and black tails. This, with the more detailed proofs elsewhere given of the above facts, settles all questions connected with the early American shows and the Light Brahmas.

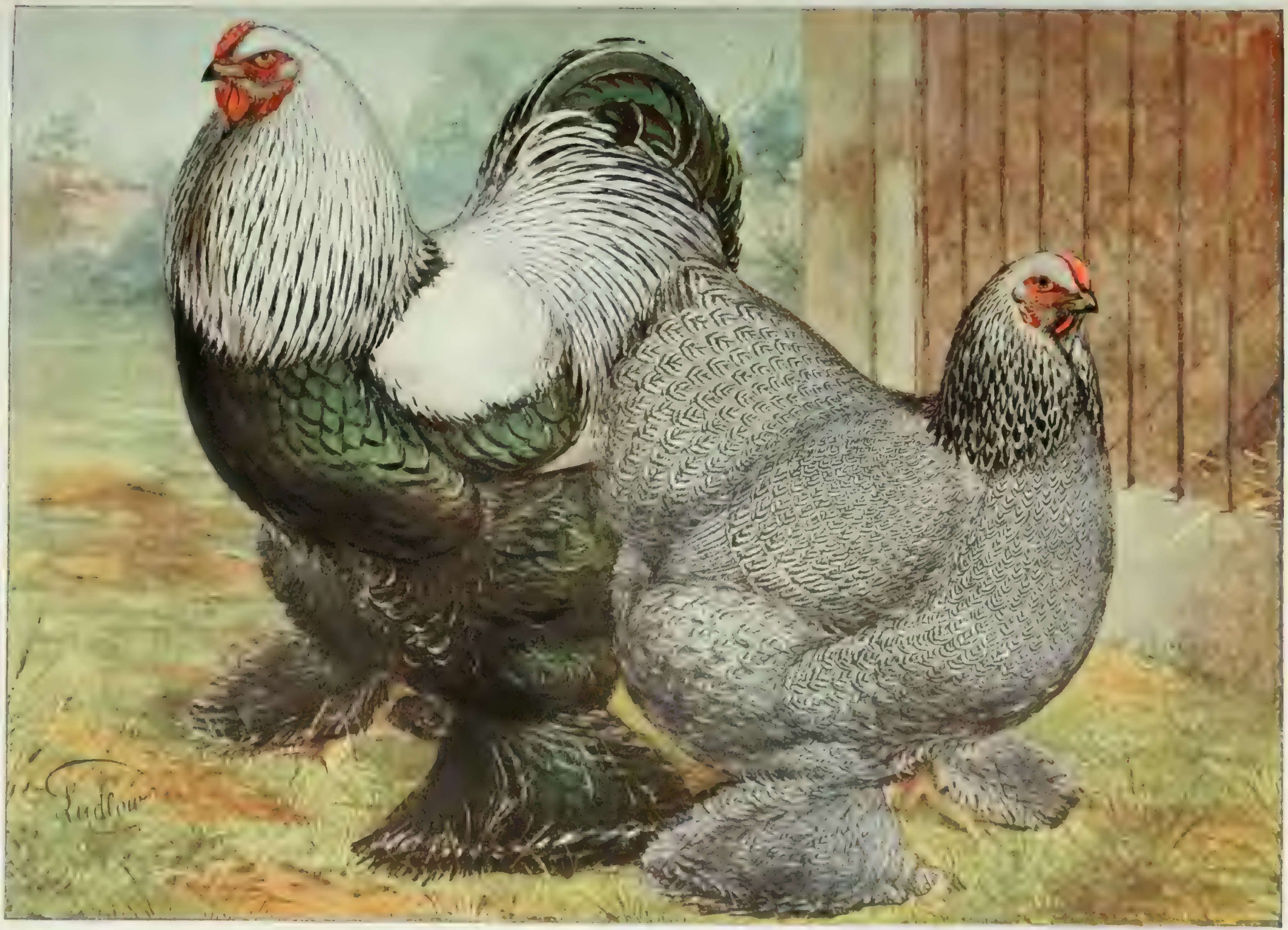
Origin of Dark Brahmas.

It is not so certain that it equally settles the origin of the Darks; and the upshot of the controversy left us, as stated at the time, rather disposed to believe that in regard to *them* we might have done poor Burnham some injustice, and that he really had originated these in his own yard. If more than this cannot be said, the reason is simply that the flat self-contradictions of the man absolutely prevent any positive conclusion: it is only possible to grope through a fog, most of which he himself has made. Previous to that controversy and the fresh light it threw on this curious old bit of poultry history, we had always thought that the Lights and the Darks were from the same stock, and Burnham himself has also written, "both the Dark and Light were bred from the same originals, precisely, at first," so that he could not complain of such a conclusion on our part. There is ample evidence, too, of the possibility of this. Miss Watts never crossed her strain, from Dr. Bennett, and assured us that she had bred by selection both Dark and Light; and Dr. Joseph Hinton, a well-known breeder in 1870, told us how his original strain was Light, but that from a darker (though only medium-coloured) bird bred by Mr. J. K. Fowler he bred a most beautiful dark cock, and hens even darker than were then often seen, the next generation producing his "Champion," a well-known show-bird of those days. There is other evidence of the same fact, but of less definite authenticity; and to show how recklessly Burnham himself has made it impossible to come to any conclusion at all with absolute certainty, he published in America in September, 1874, the statement: "I now say that neither the *Dark* Brahmas nor the *Dark* Grey Shanghaes are alluded to in *The Hen Fever*"; while at the very same date (since it was published in England in November, 1874) he wrote, contrariwise: "In *The Hen Fever* I referred to the Grey Shanghaes, Light *and Dark*, which I have bred from 1849 to 1874, and which we now call Brahmas." It is further to be noticed, that if any real distinction is to be established between the origin of Darks and Lights, it is necessary to exactly invert Burnham's own statements about both, since he affirms of the *first* ones shown (Lights) that they were the "Grey Chittagongs," while it was later that, as he affirms, he bred from his "Grey Shanghaes." And yet, in spite of all this—which it is best to dismiss as simply worthless either way—we do think, upon the whole, that there was a difference, and that Burnham did originate the Darks. Take such a passage as the following:—

> I originated the *Dark* Brahma fowl in my own yard at Melrose, Mass., Lewis! . . . The *Dark* Brahma, or Dark "Grey Shanghae," *is my patent*, Mr. Wright. I originated it, in 1853. I never saw them till that year, but it was the result of a studied experiment of mine; and I raised a great many of these fine Dark birds in the succeeding years. Look over the records and see if you can find any "*Dark* Brahmas" spoken of—anywhere on earth—until my first splendid trio went out to John Baily, of Mount Street, London, in 1853. And tell me too if, *subsequently*, at any time before the war, anybody *but* G. P. Burnham, of the United States, sent to England *one single specimen* of this Dark variety to any living man. You can't name him, sir! He doesn't exist. Nobody had that stock but myself in all those years.—*China Fowl*, p. 163.

There are several other passages like this; and after a lifetime spent in examining documents, it still appears to us, as it did in 1875, that there is a tone about them rather different from the reckless assertion and abuse of other passages such as are cited above. There seems a ring of real truth, of genuine indignation that something really done had received no recognition. Supposing that to be the case, the truth of the matter does not appear difficult to discover, if once we disregard the maze of Burnham's own contradictory statements; and the secret lies apparently in the birds previously known in America as "Chittagongs."

These fowls Burnham always admitted that he had from Dr. Kerr, of Philadelphia, as Dr. Bennett had his; but he always added the statement, carelessly adopted by Mr. Tegetmeier, that those birds also came from Shanghae. On this point, however, Dr. Kerr himself is the proper authority, and he states that they came from *Calcutta*; in fact, the Indian name alone is sufficient proof of their Indian origin. Now it is remarkable that even recently, direct Indian testimony has been given to fowls resembling the earlier Dark Brahmas being still found in the Chittagong district. The *Broad Arrow*, a Civil Service journal, reviewing in March, 1874, our monograph on the *Brahma Fowl*, attributed



DARK BRAHMAS.

the Darks to the big fowls found around the port of Chittagong; and an old Indian officer now dead, wrote us in 1872, "The fowl you make so much fuss about is the Grey Chittagong, of which I have seen hundreds in India," and we have seen other letters in MS. and print making similar statements.

If in this light we turn over Burnham's many contradictory assertions with a discriminating eclecticism, we find one that seems significant. He says, for instance (*China Fowl*, p. 97), that "the Dark and the Light varieties both came out of the Philadelphia greys, and the lighter coloured grey birds I subsequently obtained." There seems truth here as to the Darks, because if it were made up, he would be more likely to say that it was by a *darker* cross he got them. We have seen that Dr Bennett had shown grey birds cross-bred from Chittagongs at Fitchburg, and that Burnham had done the same; Hatch's Cornish Light Brahmas beating both these in popularity, and causing Dr. Bennett to drop his entirely for the new stock. We have seen further, that later on Burnham also purchased Cornish Brahmas, from Smith of Rhode Island. We have seen also that Hatch called his Cornish birds "Chittagongs," because they "in some degree resembled" the Indian fowls already known by that name; and we know that birds from Luckipoor would pass Calcutta (from which the ship probably cleared as a port), the very same place from which Kerr's Chittagongs had come. It seems probable that after Burnham, had got some of his Cornish Brahmas, he once more tried crossing *them* with his old Grey Chittagongs, and in so doing produced the Dark Brahma. If he did so, he was crossing strains both hailing from the same general locality, with more or less in general of the same Indian blood, and which "in some degree resembled" each other, as Cornish himself admits. In this way we seem to best harmonise all that is known, and as many as possible of even Burnham's own statements, and we also account for the undoubted common element in both breeds and for the pea-comb, which probably came in the first instance from the Indian bird now known as the Aseel. It is some corroboration of this conclusion that Mr. Teebay undoubtedly received all his earlier Dark Brahmas also from near Boston, which was the nearest large town in Burnham's neighbourhood.

Summing up the whole in brief, that the Light Brahmas originated in the Cornish-Chamberlain birds there is now absolutely no doubt: the controversy brought forward an absolute wealth of evidence to that effect. In all the old disputes, Mr. Cornish alone comes out clear of suspicion. In all the others, Dr. Bennett, and Plaisted, and some others, we find more or less of questionable motive, and even of proceeding; Cornish alone *never exhibited* the fowls, and as a respectable public official his evidence alone outweighs the other, but has been triumphantly corroborated. On the other hand, we think it probable that the Dark Brahma was really originated by Burnham, most likely by crossing this strain with the darker grey Chittagong already in America from the same original locality, and the earlier crosses of which had failed to make any impression, as bred by either Burnham or Dr. Bennett. If more than probability is impossible for this conclusion, the reason lies in the maze of absolute contradiction in which Burnham himself has involved whatever did take place.

American Strains.

In the United States there appears to have been somewhat more variety in strains of Light Brahmas than in England, where all have been practically derived from the stock sent over by Dr. Bennett or Mr. Burnham; the latter being, as shown above, practically identical so far as those sent to the Queen were concerned. Mr. Felch * traces various strains as follows: (1) Burnham's, later known as Phillips', and later still as the foundation of the stock of Mr. E. C. Comey and Mr. Philander Williams; but as Mr. Phillips always affirmed this stock to be the same as "the Queen's," this must now be referred really to the Cornish or Chamberlain strain. (2) Rankin's strain, affirmed to be from a fresh Indian importation; quite probably correct, as this strain was marked by a peculiar blue vein down the inside of the shanks, which it strongly transmitted, and which distinguished it from all others. (3) The Philadelphia or Tees strain, said to be the produce of Indian birds with Dr. Kerr's birds; the latter formerly regarded by Felch as Chinese, after Burnham, but which have been shown above to be also Indian on Dr. Kerr's own authority. (4) The strain from "Autocrat," bought in New York as imported from India; which is probable, as he also stamped on all his progeny a special tendency to dark under-colour; he was used by Mr. Felch and Mr. Williams, and his blood is highly valued. (5) The Chamberlain strain, believed now to be purest in Mr. Felch's, with the cross of "Autocrat" just mentioned. It will be observed that we have here more or less evidence of three fresh independent importations, *all from India;* and that when we correct Burnham's old statement about Dr. Kerr's birds being Chinese, and trace the "Queen" section of Burnham's stock, at least, to their proper source of the Cornish-Chamberlain blood from Rhode Island, the evidence is stronger than ever of the entire race tracing back, through one importation or another, to the Chittagong district of India, save only as it may have been contaminated by crosses with Burnham's or other Shanghaes.

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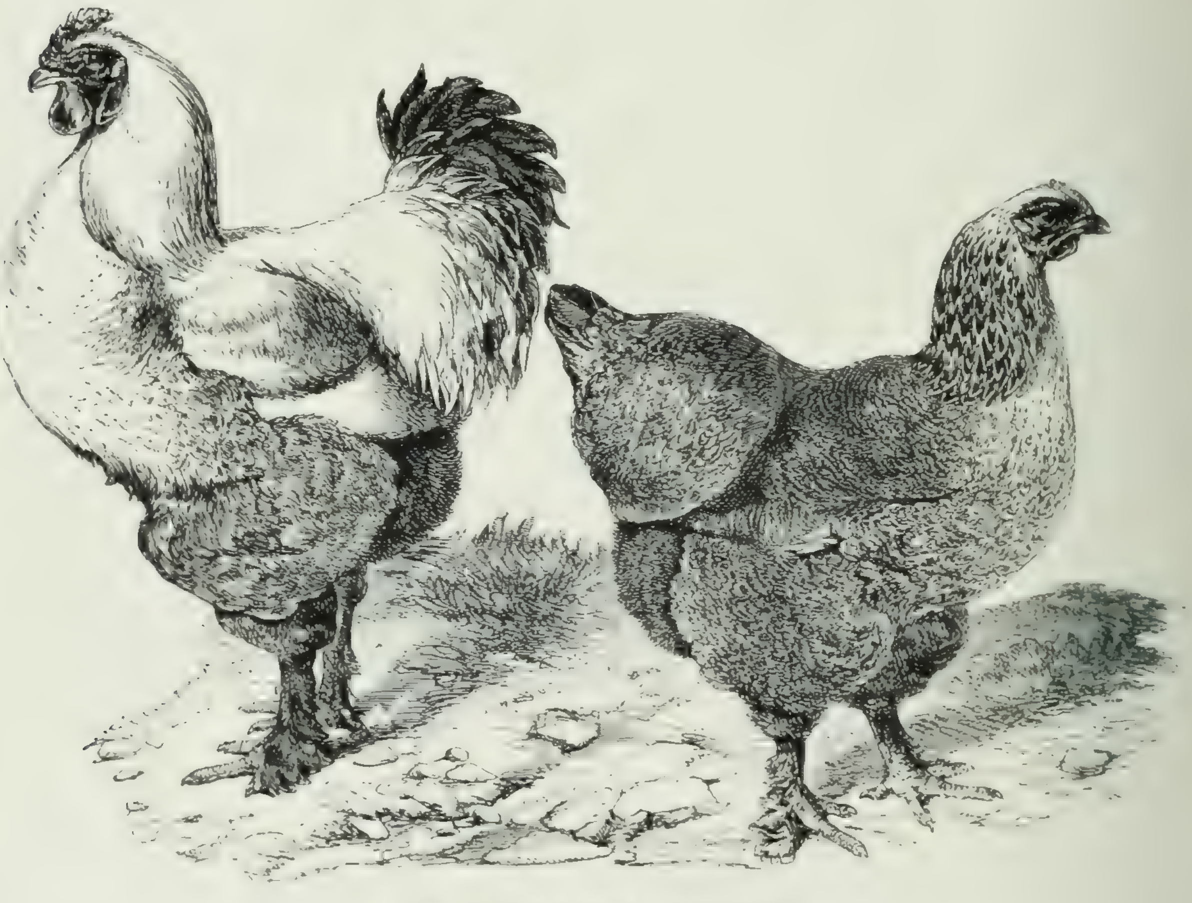
* See *Poultry Culture:* Chicago, U.S.

Variation in Type.

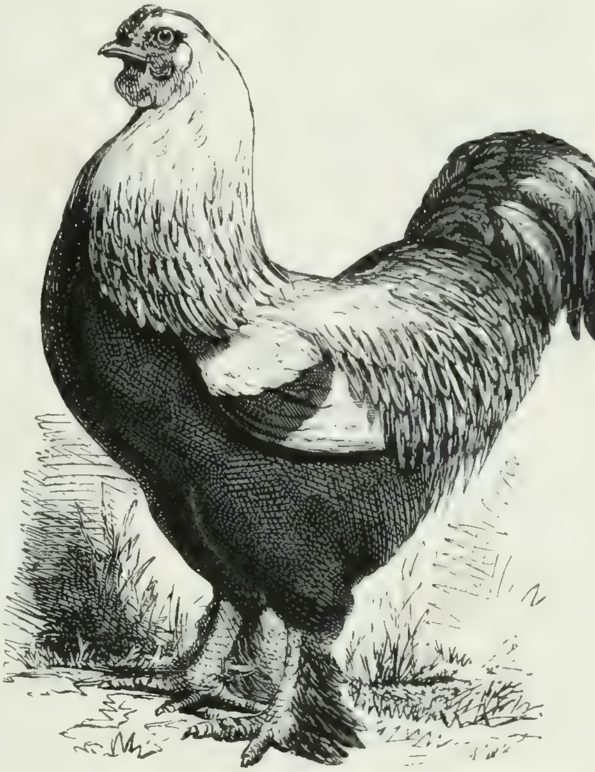
If this origin of the Brahma be borne in mind, it will be easy to understand how it has varied in model according to the selection of breeders. The feather-legged Chittagong fowl was obviously a mixture gradually formed to some rough type, of the single-combed, more fluffy, feather-legged, indolent Shanghae fowl, with a far more tight-feathered, active, and agile Indian stock, whose signs are found in the longer tail, tighter plumage, and that pea-comb, found most perfect in the Aseel, but more or less cropping up in all Indian races. In such a composite race there are always the two types contending for the mastery, and yielding to man's selection; and it is instructive to see the Shanghae and Indian types (or in that case Indian archipelago type) similarly contending for emergence in the fowl treated of in our next chapter. How different from the first Cochin type the earliest Dark Brahmas were, can be seen from the accompanying illustration, reproduced from the *Field* of December 24, 1853, of the first sent by Mr. Burnham to Mr. John Baily, of which a pair were speedily re-sold for £100. It will be noticed at once that the birds are far more bold and active-looking, have far more tail, quite different carriage, (upright instead of forward) and in particular, far more length of body.



The First Dark Brahmas sent to England.

In what a noble form the Indian type sometimes came out, may be seen from the contemporary portrait of our own old "Favourite

2," of 1871. He was the son of a bird even more slim and agile than himself, of a strain (Mr. W. Hargreaves, of Bacup) renowned for breeding beautiful cockerels, many of which were of course of much more orthodox sort, or they would not have been successful. This one of his progeny won second prize at Bristol in a class of forty, the largest class of Brahma cockerels ever exhibited up to that time, and was in his turn the sire of the cup-winner at the Crystal Palace and Birmingham in 1872. Artists who could draw fowls were scarce in those days, and his head is not "fine" enough; but the contour is true, and the bird appears "alive" in the drawing. Looking at it critically, one sees the same greater proportionate length of body; but the most striking feature, next to the full and sweeping tail, is the magnificent "balance" of the bird, and the supple vigour of his attitude. He flew to the top of a six-foot fence with ease; in fighting struck with the spur like a game cock; and it would have been dangerous for any stranger to touch one of his hens. Mr. Teebay, who judged at Bristol, told us that though not of the customary style for exhibition, he also knew that type of bird well, as appearing from time to time in the Dark Brahma; and we have also seen the same general pattern, with less tail, but the same grand sweep of outline, active lissomeness, and noble carriage, in the yards of Lady Gwydr and others, though of course the slimmest and longest-tailed ones were kept at home as not likely to find favour with the judges.


"Favourite 2."

It is difficult now not to regret that even this more pronounced development of the Indian type, rather than the Chinese, had not been encouraged; for it was full of good qualities which the Chinese type does not possess. The skin was thin and pinky-white; the pullets were often magnificent layers, and showed only moderate broodiness at long intervals; the breast was long and deep, so that the fowl on the table looked like a small turkey. Such was the more Indian type of the original Brahma fowl; but, in spite of the early lesson presented by the question of comb, no one properly understood then the significance of the choice to be made between the mixed components in its blood. For the struggle came out plainly in that question of comb. Some chickens had single-combs, some pea-combs, and either could have been bred with ease amongst English stock; in America there were strains which chiefly bred one or the other, owing to the rivalry of Bennett and Burnham. In this point the Indian feature was fixed without the slightest difficulty, and there is little doubt that fixing it had some influence in a tendency towards other features of the Indian model; but in regard to Brahmas, English judging has been unfortunately more erratic than in the case of almost any other breed. For years any approach to a covered hock was so persistently disqualified, that shanks almost as bare as present-day Langshans became the rule. When breeders had at last got good leg-feather to be accepted, the two leading judges began giving prizes to pullets which only weighed about 6 lbs. each, and were narrow weeds with nothing Brahma about them except pea-combs, for a new style of broad and very rich marking; none of these birds ever reappeared as hens, and their encouragement did much harm in many yards. Then the awards went, in flat contradiction of this, to a very silvery pencilling, usually found with white heads, which was exhibited (chiefly by one exhibitor, who it was notorious had his stock from one of the judges) in birds larger than the preceding, but still narrow and weedy in build, and short of leg-feather as those also had been. Finally, and probably in sheer reaction from this fashion, the pendulum swung right over from it to breadth of body and loose plumage, and tremendous leg-feather (with vulture-hocks) which had already found toleration amongst the Cochins of that day. With this change in fashion, the Chinese element began to over-power the Indian, and the Brahma to assume more and more of Cochin character; losing far too much at the same time, unfortunately, of its former good qualities. There was a time, indeed, when many winners were little else than Cochins of another colour, with the constant broodiness, thick skins, and coarse flesh which generally accompany that model; but some reaction from that extreme has lately been observable.

Characteristics of Brahmas.

Under these circumstances the general characteristics of Brahmas cannot be described with quite the same definiteness as in the case of some other breeds. Both the Dark and the Light are supposed to be exactly the same in size, shape, and carriage; but this has not always been the case, and can hardly be said to have been absolutely so at the end of 1900. In the earlier days of the breed the Lights were considerably inferior to the Darks, possibly owing to mixture with Cochin strains; now the Lights as a rule are more broad and massive and fluffy than the Darks, with more of the Cochin type. This should not be so; but the truth really is that the Dark Brahma breeders have made rather a more successful fight for the Brahma model, and it is too true that under many judges a Light Brahma cock of the same model as is still often seen in Darks, would stand little chance. Still, the leading points may be preserved in both colours, and may be described as follows.

The Brahma as a rule looks smaller than a Cochin, but is in reality very often heavier, because the Cochin's loose fluff adds to its apparent bulk. On the other hand the Brahma plumage, though far more abundant than formerly, is still desired to be close-fitting. Cockerels six months old should weigh 8 or 9 lbs., and pullets 7 lbs. or more; really pure-bred strains are never remarkable for early weights, though these may be forced; but on the other hand they grow more than most other breeds the second year. Adults sometimes reach great weights. We *once* knew a cock weigh 18 lbs., but he was a brute; 14 lbs. and 15 lbs. we have come across several times in exhibition specimens, but 11 to 12 lbs. is more usual. The heaviest hen we possessed was 11¼ lbs., but we knew several over 12 lbs. As a rule these enormous birds are deficient in symmetry.

The head of the cock should be small, short, and rather wide over the eyes; not enough to give a cruel or Malay expression, but a sort of peculiar archness or intelligence: the beak also should be thick and short, in harmony with the grouse-head model. Many birds lately have had large and coarse heads, or else long and slender face and beak, either of which looks very mean. The comb—the "pea-comb"—resembles three small combs pressed into one, the centre being the highest. This should be small, with the centre ridge straight, and the shape preferred is to rise somewhat from front to centre or beyond, and then decrease a little, with a slight arch. Formerly a very common shape was to rise towards a peak behind, and this is still occasionally seen, but looks very ugly. In some cases we have seen a comb evidently of this type originally, with the rising portion at the back cut off, as shown by the glossy scar: trimming of this kind should not pass unnoticed. The face should be fairly smooth, not too hairy. The ear-lobes in all early Brahmas which we can remember were so long as to fall below the wattles, which ought to be rather small, not long and pendulous; this should be sought therefore as a Brahma point. They should be smooth and bright red and free from feathers.

The neck should be very full in hackle, so that it stands out and makes a sort of junction with the head. It should be long, and well arched, which gives grandeur and nobility of appearance; but the more Cochin-shaped birds generally have rather short necks. The shoulders should be wide and flat, not too much gable-shaped, and the back short, the saddle starting from very little behind the base of the hackle. The saddle is, however, to be very long as well as wide, rising uninterruptedly to the tail, with hackles long and abundant, flowing well over the points of the wings. However massive and thick the bird is otherwise, or even fluffy, the saddle feathers should lie close and hard-looking, and rise more and more with almost a concave profile towards the tail, which rises still more upright so as to form part of the same graceful "sweep" of line from end to end. The tail may be nearly upright, but should not be quite so, and in any case should work in with the contour of the saddle, not stand up "out" of it. However profuse in plumage and thick in shape, this Brahma "sweep" should be well seen, and is faithfully depicted in the coloured illustration, which at the same time should be massive enough for anybody.

The real Brahma tail is itself characteristic, but only seen occasionally. It is sometimes described as if the upper sickles diverged, but cally clear all over, and the best breeders have a fair proportion that moult out as clear. This breeding for colour and marking affected the type somewhat for a time, but we are pleased to see that the general character of the breed is returning without losing any of its beauty. This want of shape and grandeur was apparent in the beautifully marked pullets shown many years ago by the Rev. J. D. Peake and Rev. T. C. Peake, from which we believe most of the present clear-grounded birds are descended; and much as we admire the marking itself, we scarcely ever see a hen of it, which in size or shape can be compared to those of a former period. Another serious drawback, in *our* opinion, is the loss of the old striped hackles. Birds bred for this marking become more and more pencilled in hackles, as in Partridge Cochins, and several breeders profess now to admire this marking, and consider it the proper one: but this is evidently the old case of the fox who lost his tail, and because they cannot help themselves.

A dark grey ground also holds its own to some extent, and most of such birds are superior in size to the preceding, and some of them make really fine hens. Some of these have very fair striped hackles, and are usually better layers than the paper-ground birds. Mr. Henshall has often shown fine Brahma pullets and hens of this type, while Mr. Norris-Elye and Mr. J. Martin Longe have been prominent exhibitors of the paper-ground birds.

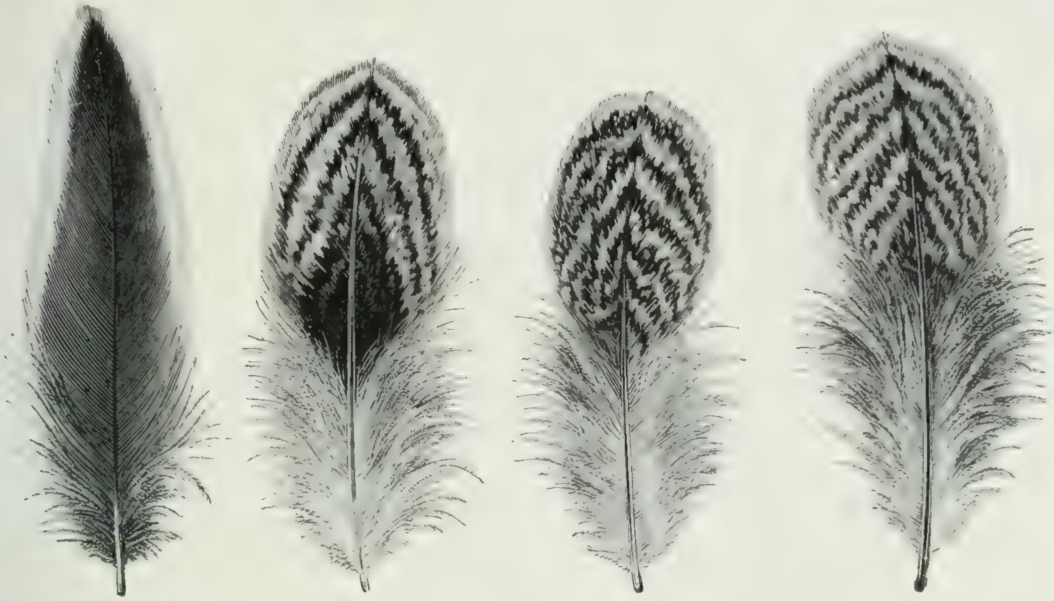


Fig. 95.—Dark Brahma Pullet Feathers in 1871.

Breeding Dark Brahmas.

These changes in colour have very much altered the breeding of Brahmas for exhibition, so that it is now impossible to breed the fashionable colours good in both sexes, from the same breeding pen. This is, however, entirely owing to the change in colour, and it is quite wrong to assert, as some breeders do, that black-breasted cockerels and well-pencilled pullets—so far as pencilling only goes—cannot be bred together successfully, or from the same stock. Mrs. Hurt's celebrated strain of thirty years ago was beautifully marked and everywhere successful, and a large portion of the cockerels always came black-breasted; and going back to our own experience, a son of our old "Favourite 2" which won the cup in 1872 at both the Crystal Palace and Birmingham, after his purchase by Messrs. Newnham and Manby became the sire of a number of pullets that were well known for several years. The real incompatibles are the extremely light ground-colour in pullets, combined with solid black underparts, especially black fluff, in the cockerels. People who wish to exhibit birds to win now must breed from two pens.

To breed exhibition cockerels, the first essential is, as in all cases of double mating, a sufficiently good exhibition cockerel or cock in all points of head, shape, colour, and plumage: the one point which may be perhaps spared to save the pocket, is size, which is not very important if his hens are massive and large. The points need not be repeated in detail, laying emphasis only upon the colour of the white, which is all-important. Nothing but vexation can come of breeding from yellow birds, or any with red about the back or shoulders; and while the exhibitor saves the colour of a good bird all he can by keeping him out of the sun, on the other hand, if in his choice for breeding he can pick up one that has been out a great deal in all weathers, *and yet* kept his silvery colour, such an one is twice the value. There are such birds, and there is that difference in strains. This bird we choose on his own merits, and no more need be said.

Of the hens to put with him, among all the mixture of strains one important point is that they be more or less of the same cock-breeding strain: for this we have to trust to personal knowledge or inquiry. The only "points" that can be certainly laid down are, that they must have good heads with small neat combs, and solidly-striped hackles. The body-colour of good cock-breeders varies enormously. We have seen some nearly black, others black pencilled on brown, others covered with minute microscopic pencilling, hardly visible, on a dark slate-colour; very rarely a really well-pencilled blue-grey hen will breed good cockerels, but generally the offspring of such are spotted on breast. As a rule these hens are pretty dark, and at least very poorly marked; and supposing they have good hackles—that is one point which really can be seen and is essential—the blood of good exhibition birds in their veins is the main thing. If the cock is short of shank-feather, they must of course have abundance, but that is obvious. In starting a new strain, if the cock or cockerel is really good, however poor the first year's produce may be, breeding back to the cock the next season will generally give an adequate reward, and so on while line-breeding is carried on.

The pullet-breeding pen will be entirely different. Here we must select the females from the exhibition point of view, at least as regards colour and marking, and be especially severe as regards breast-pencilling under the very throat. It is an excellent plan to have one or two birds rather darker than the rest in starting a new pen, and to keep watch which hit the best. The great point is uniformity of marking. It is very common to see good breasts with cushion-markings so small as to be indistinct; or there may be a brown patch on the wing. A hen which was clear as a pullet and moulted clear, is especially valuable. If possible select some striped hackles and some pencilled, with a view to avoid getting the whole strain pencilled all up the neck. Most pullets from a clear ground strain, will have what may be called partly-pencilled hackles, which moult out more pencilled still. Pullets of the darker steel-grey type are much more easy to obtain with properly striped hackles. The great faults of the clear pullets at present are want of size, and long narrow backs, and these faults should as far as possible be avoided.

The feathers photographed in Fig. 96 from a prize bird of 1900, the specimens being supplied by Mr. J. Martin Longe, represent the exhibition type of that day, and it may be interesting to compare them with those shown in Fig. 95 of nearly thirty years before. It will be seen that the pencilling has become broader, and the bands, upon the whole, are more solid and sharply defined. The two hackles exhibit a greater and less degree of pencilling, which increases in most birds the second year, and is tending to increase more and more as the pencilled strain is bred more exclusively by itself. We have seen hackles in some hens recently, and now and then even in pullets, far more pencilled than this, and with that straight-across barring (like that of a Pencilled Hamburgh) which we have already referred to in the case of Partridge Cochins. The law of Nature appears to work out the same way in all cases of breeding for purely pencilled marking, and there is little doubt that a straight-pencilled Brahma could be ultimately produced, and perhaps one day may be the accepted type of bird.

In choosing the male bird, again we must start with the condition that he be of the right strain; because even cock-breeding strains occasionally produce a mottled or laced-breasted cockerel, and such an one will not answer. Supposing that, his chief points are dense striping in his hackles, and all the better if with a hair-line edge as in Fig. 93. This should be free from white streak as drawn, and the tolerance of white shaft or streak is the chief cause of the prevalence of pencilled hackles in the pullets, which may to some extent be kept in abeyance by choosing solid striping in the cockerels. The cape, or back under the hackle, should be black feathers well laced with white; and the edges of the lacing at the tail coverts should be sharp and clear. The best colour for the cockerel's breast is a narrow lacing with white on each feather; but another marking which answers well, especially with the darker pullets, is a small pear-shaped white spot on the tip of each, with the shaft showing as a black line up its centre. The cockerel or cock should also be compared with his mates in regard to their respective colour fore and aft. If the hens have perfect breasts but poorly-marked cushion, the cock should have narrow but intense stripes in his saddle and tail-coverts, and sharply laced fluff; if the hens or pullets fail near the throat, the male should be narrower in lacing up there, and than he is on the fluff, and on no account have a white cravat.

Some breeders of Brahmas have always objected to the double-mating system. Amongst them is Mrs. A. Campbell, of Uley, in Gloucestershire, who wrote in 1900:

"I have always bred my Dark Brahmas of both sexes from the same pen. I do not at all admire the snaky-headed pullets which now win, which have neither the size, nor the shape, nor the feather of the old-fashioned Brahma. I think it a pity that one shade of colour should be thought of more importance than all these, and live in hopes of the fashion changing to the darker shades; it is such a satisfaction to see one's hens improving, if anything, after each moult.

"A few years ago, at the 'Royal' show held at Chester in 1893, I won first in cockerels and pullets with own brother and sister, and a splendid layer she was; she laid before the show in June, and when she came back laid seven days running; and in her second year laid about 23 eggs per month in the four months of January, February, March, and April, before getting broody—so show birds are sometimes 'utility' birds too. Then I won the Poultry Club medal with both a cock and hen, own brother and sister, and in 1894 I won at Tunbridge Wells with brother and sister: in the former case the cock won altogether at 26 shows and his sister at 32 shows. I admit that I get a larger percentage of cockerels for show than I do pullets.

"The loss of size from this new craze is I think worst of all. The 'two pen' system I am sure hinders many from taking up the breed for exhibition, for not every one has space enough. I shall stick to the old way, and believe I shall win with it still."

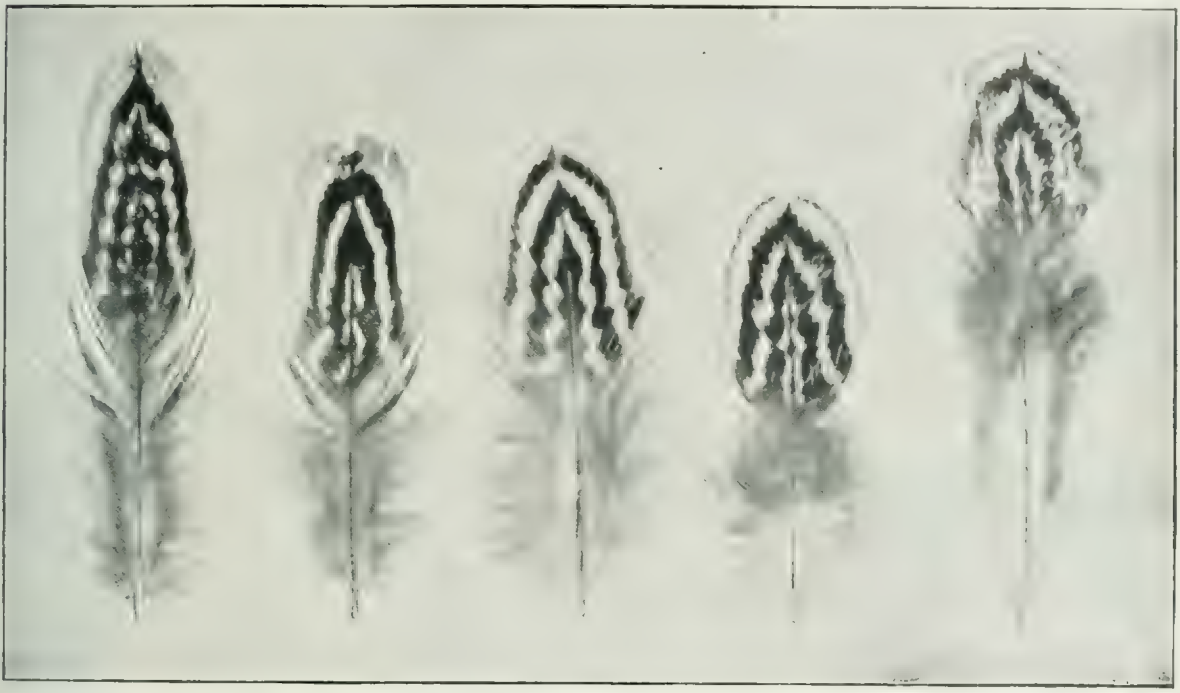

Fully pencilled Hackle. Partly pencilled Hackle. Breast. Wing. Cushion

Fig. 96.—Feathers from Dark Brahma Pullet, 1900.

Writing now, in 1911, Mrs. Campbell sees no reason to alter the foregoing remarks, but considers Dark hens have been shown recently much finer in size and shape. Dark cockerels seem to have slipped back in numbers, for in 1909 and 1910 the Dairy classes were cancelled.

Our experience was that it was perfectly possible, with the richer colour, to produce both sexes of the same strain for exhibition. The simple necessities were that while the breast might be perfectly black, and if so must be up to the very throat, the fluff behind the thighs had to be a little laced round the edges. The rest depended upon the strain, and upon a proper *balance* of striping in the cockerels, as between neck-hackle in front, and saddle-hackle and tail-coverts at the other end. We too could heartily wish that the grander and darker birds of former years could be revived.

One expedient has sometimes occurred to us, which might perhaps meet the views of both parties, more especially in days when the making of extra varieties seems fashionable. It would consist in recognising the newer colour, and dividing the Dark Brahma into two varieties. If the lighter shades in pullets and hens were called say "silver-pencilled" Brahmas, and their laced-breasted cockerels (which are sometimes very beautiful) shown as their mates, breeders of this type would have a scope for their cockerels which they have not now, and breeding for marking only might be expected to reach yet greater perfection. On the other hand the "Dark" Brahma could then be restricted to the really dark birds, which also could be bred and shown as in the olden days. Even in these, speckled-breasted cockerels often occurred, and were invaluable for pullet-breeding; but these often produced black-breasted offspring in turn, and had a sort of *deep* colour about their black which is very different from such as would be shown in the suggested laced or speckled "silver" class. Generally speaking, whatever system of breeding be pursued, it is better to use a cockerel bred from hens or pullets a shade darker than the colour desired, or those he is mated with, as in the pale-grounded strains especially, the depth of colour tends to run out.

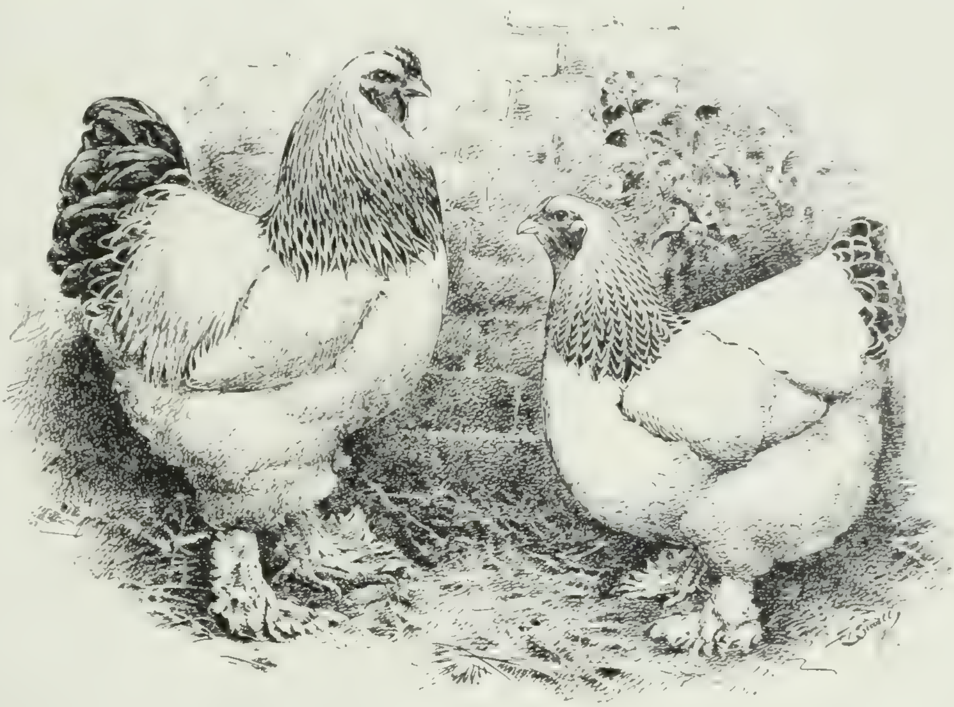
Weeding out wasters is in one point rather a ticklish process in Brahmas. By the time they are four or five months old, many of the cockerels are so dreadfully "gawky" that no one could believe they could ever come to any good, whereas these ugly birds often turn out best. But we learnt in our own yard that at ten or twelve weeks old, very often much of the real carriage and gait would be seen, to be lost for several months and then recovered again in the grown bird. An eye should always be kept upon the cockerels at this age, therefore; and if a chicken has fine body and proportion then, never mind if he gets leggy and ugly later on; let him make his frame, and by-and-bye he will settle down again. Light chickens often show all sorts of black splashes, which moult out by autumn. Dark cockerels usually have more or less brown in their chicken feathers, which moult out clear; but these are certainly less common than they were, and it is possible that some day we may have a race that never shows other than pure white and black.

Brahmas in America.

The type of Brahma in America, as we have gathered from attentive comparison of many articles and illustrations, and correspondence with the veteran Mr. I. K. Felch (of Natick) and Messrs. Sharp (of Taunton, Mass.), differs very considerably from the British in both varieties. In regard to shape, American breeders have mainly kept to the older model, with less fluff and foot feather, as it was known in England about 1870–4. Especially have they retained the *longer body* of the more Indian component in the fowl, and consistently disqualified for stiff projecting hocks. From these causes the Brahma in America has retained much of its popularity and reputation as a "utility" fowl, some of the very best layers recorded — far above 200 eggs per annum— being Light Brahmas, and some of these successful exhibition specimens. Mr. I. K. Felch writes us, that from the average of many observations, so far as he has been able to compare specimens (derived from English stock) of the more Chinese or short-bodied type, the "long-bodied Brahma will lay at least 40 per cent. more eggs than the shorter-bodied birds." If there is anything in "egg-type" at all, this is probably correct.

Some prominent breeders have during late years endeavoured to produce profuse shank-feather in combination with soft curling hocks, and have succeeded in great measure, as in the case of Cochins. The illustrations we have seen of this class of birds appear to indicate a rather shorter body than the older type, but still with more length and sprightliness of form than shown by most of the present English exhibition Brahmas. The accompanying illustration by Mr. Franklane Sewell, *facile princeps* as the poultry artist of America (for which we are again indebted to the *Reliable Poultry Journal*), exhibits this more modern type of American Brahma. The length of body in the cock will be noticed, and the greater squareness and sturdiness of the hen. Some American breeders of the old school would perhaps consider her, at least, rather too Cochiny, and both would, we think, if fine in size and colour, still stand pretty well at even a great English show. Not many years ago they would certainly have won at such; but, as just observed, are themselves a somewhat modified type of American Brahma.

Taking the colours, in Light Brahmas the American breeders have achieved greater success than the British, simply because they have set themselves to do it, and refused to tolerate faults often seen in English prize birds. Such black specks and splashes all over as have sometimes been common with us are not tolerated, especially about the backs of the birds; and the hackles are more uniformly and sharply striped, also the tail-coverts in the cocks. Such black and cloudy hackles as we have often seen in hens do not pass muster at a good American show. Much greater attention is also paid to the correct colour of flights and secondaries; and it is at least possible that this particularity may have to do with the breeding out of faults elsewhere. The American light Brahma is a somewhat heavier bird than its dark relative, the standard weights being, cock, 12 lb.; cockerel, 10 lb.; hen, 9½ lb.; and pullet, 8 lb.; while those for the dark are cock, 11 lb.; cockerel, 9 lb.; hen, 8½ lb.; and pullet, 7 lb.



American Light Brahmas

In Dark Brahmas the older model is more preserved than in the modified Lights as here illustrated, although something has lately been done to produce specimens of heavier feather; but there is no doubt that the Dark Brahma is far less bred than the Light in the United States. In colour and marking both American and English breeders who have seen both consider the English birds much superior, so far at least as hens or pullets are concerned; but all agree that unless size and character can be added to the marking, the clear ground-colour so much valued in England would not be accepted without these points.

Qualities of Brahmas.

The economic merits of the Brahma cannot be stated with the same confidence as forty years ago, owing to the changes which have taken place, as above stated. We have known it as a magnificent layer, and in the first edition of *The Illustrated Book of Poultry* we cited cases, some from our own strain, where far above 200 eggs in a year had been recorded. In America there are many such strains still; but in the old country we fear it would be difficult now to find such, though Mrs. Campbell's evidence above is worthy of note. There are various causes for the decline in laying powers, which is certainly general. Of course, the one general cause of breeding merely for feather has some effect, as in all other cases; but that alone is usually soon recovered from in "utility" stock, such as gets about the country. In addition to that, however, the Brahma is a breed in which it is particularly desirable to keep the pullets back from laying, with a view to the best show condition; and this, repeated for generations, has also had effect. But beyond even these factors, all experience goes to show that activity and close plumage are indispensable to any marked laying power; and the gradual change to looser feather, with wider and shorter body, has had probably the greatest share in the deterioration; the bird has actually been bred to a *model* which cannot lay so well as the older one. There are still to be found about the country flocks derived from the older stocks, which keep up the old reputation; but if the Brahma is desired as a layer, some effort should be made to ascertain what the character of the strain really is in that respect.

Table quality has, we think, suffered less, but is far from uniform. The heavy hock is too often accompanied by want of breast, and the more fluffy plumage is, correspondingly, often associated with a coarse or even yellow skin. But these points are by no means always so, and the older thin, pinky skin is often to be found. Where this is present, with a good shape of body and long breast-bone, the Brahma is a splendid table-fowl, even pure. It is often called coarse; but such birds as we had to kill in old days never failed to win praise as something better than most of our visitors had either seen or partaken of before; the meat was (except on the legs) white and juicy. If economic qualities like these are wished, however, they must now be bred for; they cannot be depended upon in almost every strain as was once the case.

As a cross the breed is very valuable, for with the Dorking they make a splendid table-fowl, showing good breast and a sweet, juicy meat, using for preference the Dorking male; and either of the French breeds also produces good crosses. The cross with a Minorca cock usually produces a large and hardy bird that lays splendidly, and is a very fair table fowl; and of habits, and dark colour, and hardiness, and general qualities which make it very suitable for runs in a town. In choosing birds for producing economic crosses, however, great care should be taken to select a proper model, especially in regard to the length of body and proper development of breast. Where any fault is to be found with the result of Brahma crosses, the reason will be found in want of care in these respects.

Judging Brahmas.

In judging Brahmas, the most important point is to give still, so far as possible, proper weight to Brahma characteristics as compared with Cochin points. That is not so easy now as formerly; but the small wattles and long ear-lobes, the short grouse head, close plumage, and chief of all, the cushion or saddle rising more and more into the tail, and grand "sweep" of outline in the male bird—these are points which a judge may and should still keep in mind.

Photo] [Feathered World Bureau

Dark Brahma Cock, 1st, Crystal Palace, 1909

Whether any more can be done, it is never possible to say in the poultry world. Vulture-hock and excessive leg-feather can be bred out again, and more importance laid upon size and character in the pullets, and a return to the longer and more agile body once general in the breed, and an insistence on *striped* hackles in the females, as once demanded, and which of itself would set right several points; but wishes count for little. We may, however, point out here, once for all, an important matter which this breed well illustrates, and which we need not further mention again. While it is perfectly true, as explained at length in Chapter X., that the "standard" of judging at any show must always be and can only be a "fancy" standard, and that fanciers alone preserve breeds in their entirety, the fact remains good on the other hand, that *fancy alone* never keeps a breed widely popular. There must be a utility basis also for this; and if ever the utility basis is really deteriorated or bred actually away from, winners may still sell at high prices, but general demand is gone. We see pure "fancy," as divorced from any utility, in pigeons, some of which attract many entries and sell at high prices; but at any large show the comparative attendance is far less than in the poultry division, which has also a utility interest. It will also be observed that all the new "breeds" which have been lately introduced, and achieved such popularity, have based their claims upon being "utility" breeds, either as layers or table-fowls. From this point of view, the relative popularity of Brahmas at a time when the breed was and could be described without hesitation as one of the most generally useful in existence, and, since it has been bred away from a type that could be broadly and generally so described, is very instructive.

The Poultry Club Standard of Perfection for Brahmas is as follows:

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Small, rather short, of medium breadth, well rounded, with a slight prominence over the eyes. *Beak:* Short, curved, and very strong. *Eyes:* Large and fairly prominent. *Comb:* Triple, or "pea," as small as possible, fitting very closely to and drooping behind to follow the line of the head. *Face:* As smooth and as free from feathers or hairs as possible. *Ear-lobes:* Long, of fine texture, and free from feathers. *Wattles:* Small and well rounded, of fine texture, and free from feathers.

Neck.—Long, well covered with flowing hackles reaching well down to the shoulders, and free from twisted feathers. A depression should be apparent at the back of the skull between the head feathers and the upper hackle feathers.

Body.—Broad and square, with great depth. *Breast:* Full and carried well forward with the breast-bone horizontally. *Back:* Short, either flat or slightly hollow between the shoulders, the saddle to rise about half-way between the hackle and the tail, and to continue to rise until it reaches the tail coverts. *Wings:* Of medium size, with the lower line carried horizontally, free from twisted or slipped feathers, and tucked up under the saddle feathers, which should be of ample length.

Tail.—Of medium length, rising from the line of the saddle and carried nearly upright, with the quill feathers spreading well out, and the tail coverts broad and abundant, well curved, and nearly covering the quill feathers.

Legs and Feet.—*Legs:* Of medium length (not too short), powerful, well apart, and feathered; the thighs large, and so set that the lower feathers of the breast cover them in front; fluff soft and abundant, covering the hind parts and standing well out behind the thighs; hocks amply covered with soft rounded feathers, or with quill feathers provided they are accompanied with proportionately heavy shank and foot feathering; shank feather as profuse as possible, standing well out from the legs and toes, extending under the hock feathers and to the extremity of the middle and outer toes, profuse leg and foot feather without vulture hock being desirable. *Toes:* Four, straight, long, and spreading.

Carriage.—Sedate but fairly active.

Weight.—From 10 lb. to 12 lb.

Plumage.—Profuse, but hard and close compared with that of the Cochin.

HEN

With the exception of the *Neck*, which is rather short, and the *Legs*, which are short in proportion to the size of the bird, the general characteristics are similar to those of the cock, allowing for the natural sexual differences.

Weight.—From 7 lb. to 9 lb.

COLOUR

Beak: Yellow, or yellow and black. *Eyes:* Orange red, pearl, or grey, orange red preferred, since pearl or grey eyes are generally signs of weak constitution, and have a tendency to blindness. *Comb, Face, Ear-lobes, and Wattles:* Bright red. *Legs and Feet:* Orange yellow, or yellow; the legs often show a deep red tinge between the scales and at the back of the hock joint.

THE DARK

Plumage of the Cock.—*Head:* Silvery white. *Neck-hackle:* Silvery white, with a sharp stripe of brilliant black in the centre of each feather tapering to a point near its extremity and free from white shaft. *Breast, under-part of Body, Thighs, and Fluff:* Intense glossy black. *Back:* Silvery white, except between the shoulders, where the feathers should be glossy black, laced with white. *Saddle:* Similar to neck-hackle. *Wings:* Bows, silvery white; primaries, black, mixed with occasional feathers having a narrow white edge on outside of web; secondaries, part of outer web forming "bay" white, remainder of feathers forming "butt" black; coverts, glossy black, forming a distinct bar across the wing when folded. *Tail:* Black, or coverts laced or edged with white. *Leg-feathers:* Black, or black slightly mixed with white, but black preferred.

Plumage of the Hen.—*Head:* Silvery white, or white striped with black or grey. *Neck-hackle:* Similar to that of the cock, or the centres showing pencilling as on the body. *Tail:* Black, or black edged with grey, or with pencilling. *Remainder of Plumage :* Ground colour, any shade of clear grey ; pencilling black, or a darker shade of grey than the body or ground colour, following the outline of each feather, fine, sharply defined, uniform, and as numerous as possible.

THE LIGHT

Plumage of the Cock.—*Head and Neck-hackle :* Similar to those of the Dark. *Saddle :* White, or white slightly striped with black, white preferable and the dark saddle only admissible in birds with very dark neck-hackles. *Wings :* Primaries, black, or black edged with white ; secondaries, white on outside web, black on part of inside web. *Tail :* Black, or black edged with white ; coverts, glossy black, some evenly laced with white. *Remainder of Plumage :* Clear white, with either white, blue-white, or slate under-colour, though this latter should not be visible when the feathers are undisturbed. A mixture of black and white is admissible in the shank and toe feathering.

Plumage of the Hen.—*Neck - hackle :* Silvery white striped with black, the striping being more dense at the lower part of the hackle, and the black centre of each feather to be entirely surrounded by a white margin. In other respects the colour of the hen is similar to that of the cock.

SCALE OF DEFECTS

IN THE DARK VARIETY

COCK

	Deduct up to
Colour : impure white, 10 ; breast patched or splashed with white, 7 ; tail splashed with white, 5 ; excessive white in feet or shanks, 3 ; other defects, 6	31
Head (including stain of white in lobes, 2) ..	11
Hackle : want of stripe, 5 ; scanty, 4	9
Legs : feathering, 6 ; pale shanks, 2	8
Size	8
Carriage or symmetry	8
Wings : primaries out of order	6
Saddle : scanty or Cochin carriage	5
Condition	5
Fluff : scanty	3
Tail : shape or carriage	3
Toes : curved	3
	100

HEN

	Deduct
Colour : dull or uneven ground, 9 ; white in foot feather, 4 ; other defects, 5	18
Marking : irregular pencilling of body, 10 ; of shank feathering, 3	13
Head (including stain of white in lobes, 2) ..	10

DEFECTS—DARK VARIETY, HEN (*Contd.*)—

	Deduct
Legs : feathering, 7 ; pale shanks, 2	9
Breast : streaky or hollow	9
Size	8
Carriage or symmetry	8
Cushion : scanty or Cochin carriage	6
Condition	5
Hackle : scanty	4
Fluff : scanty	4
Tail : shape or carriage	3
Toes : curved	3
	100

IN THE LIGHT VARIETY

COCK

	Deduct
Colour : impure white, 10 ; splashes of white in tail, 5 ; black in breast, 4 ; much black in hock, 4 ; black in fluff, 3 ; other defects, 4	30
Head (including stain of white in lobes, 2) ..	10
Hackle : want of stripe, 5 ; scanty, 4	9
Legs : feathering, 6 ; pale shanks, 2	8
Size	8
Carriage or symmetry	8
Saddle : scanty, or Cochin carriage, 5 ; striped, 2	7
Wings : primaries out of condition	6
Condition	5
Fluff : scanty	3
Tail : shape or carriage	3
Toes : curved	3
	100

HEN

	Deduct
Colour : much black in hock, 15 ; impure white, 10 ; black splashes, 10 ; other defects, 6	41
Head (including stain of white in lobes, 2) ..	10
Legs : feathering, 7 ; pale shanks, 2	9
Size	8
Carriage or symmetry	8
Cushion : scanty, or Cochin carriage	6
Condition	5
Hackle : scanty	4
Fluff : scanty	4
Tail : shape or carriage	3
Toes : curved	2
	100

Serious defects : Comb other than pea shape ; badly twisted hackle or wing feathers ; total absence of leg feather ; great want of size in adults ; total want of condition ; white legs ; deformity of any kind ; buff on any part of the plumage of Lights ; much red or yellow in the plumage or much white in the tail of Dark cocks ; utter want of pencilling, or patches of brown or red in plumage of Dark hens.

CHAPTER XVII.

LANGSHANS.

IT seems more than probable that birds very similar to Langshans had been imported as Black Cochins in the early days of those fowls; but the fowls now known under this name were first received in 1872 by the late Major Croad from the district whose name they bear, and exhibited in the Variety Class at the Crystal Palace show the same year, where they received a V.H.C. card. Reporters and judges, without exception, wrote of and described them as Black Cochins; that was the impression the birds themselves then made upon everyone who saw them; but the question of their distinctness from that breed, and what they really were, gave rise to a controversy which for rancour and almost ferocity on one side has had no parallel in poultry history. Now that it can be seen how much real distinctiveness there really is in the Langshan, and that its advocates had some truth on their side, it is impossible not to regret more than ever that such a spirit should not only have retarded the object they desired, but also, in the end, given to the fowl a type which its early advocates dislike and condemn, but which has come about as a natural consequence of the line of conduct pursued.

The Original Langshans.

It may seem strange to breeders who look at Langshans of to-day, or at the illustration to this chapter by Mr. Ludlow, that the fowl should ever have been confounded with the Cochin. Such birds, indeed, never would have been so; but the fact is that birds like these were never then seen. What the Langshan was in the early days is shown by the accompanying illustration (kindly supplied by Mr. Gedney), which was published as the frontispiece to two editions of *The Langshan Fowl*,* and which can be compared with the drawing of early Cochins on page 243. It was inevitable that when such birds were seen in the show-pen they should be classed as Cochins. All the judges—including Messrs. Hewitt, and Teebay, and Leno, and Dixon, and Tegetmeier, and Nicholls—considered them such; all the reporters of all the poultry journals formed the same impression: we ourselves shared it to the fullest extent. The only real difference to be observed was the pure black colour of the shanks; and on this point it was remembered that Black Cochins also had been long ago reported* as coming with black legs, and that the yellow shank, though striven for, had always been a difficulty, as it is with Black Leghorns to-day. Black Cochin breeders, at all events, gladly resorted to the new blood, which blended with the old in the kindliest way, and speedily worked a most marvellous improvement in that breed, which has continued to the present time.

The Langshan Controversy.

In spite of all this, we now know that the Langshan really possessed a very distinctive extra-Cochin element indeed, though amalgamated with Shanghae blood, as such had been in the Brahma, and as susceptible as in that breed, of more or less development by wise or unwise selection. It was their intuitive experimental knowledge of this real distinctiveness, that caused so much feeling amongst early Langshan breeders; but there was no excuse for the way in which that feeling found expression, even though it may have had one good result in preventing the absorption amongst Cochins of a fowl which had better and distinctive qualities of its own. What ought to have been done was to select and exhibit the most distinctive type, and thus to show wherein the difference existed; but here Langshan breeders gave no help. Birds were shown of the most opposite types—some quite fair Black Cochins, with ample leg-feather and vulture hocks; others almost as tall and bare-legged as a Malay. It was admitted that some were bare-legged; that some had crests, and some rose-combs; some black, and some brown eyes; but fanciers were asked to believe that as such variations were found "in our imported stock," they were "accidents and non-essentials," and did not prevent the fowl being "one of the purest, if not the purest breed we have." The fowl was indeed supposed to be quite *sui generis*. Said to be a sacred bird in its own country, there arose something like a *cultus* of the Langshan* in England also; while in default of distinctive type and explanation, its claims were supported by statements simply absurd. It was said the fowl was distinct in some way from others, and believed to be "allied to the wild turkey." When this was justly ridiculed, it was explained away as the belief of the Chinese, forgetting that the wild turkey is not even known in China. It was further asserted that Langshans were entirely free "from that essentially Cochin disease, elephantiasis" (scaly leg), and that as this alone was a "conclusive answer" to any connection between the two breeds, "none of our opponents have ventured to say anything about it." More lately Miss Croad reaffirms that this was true

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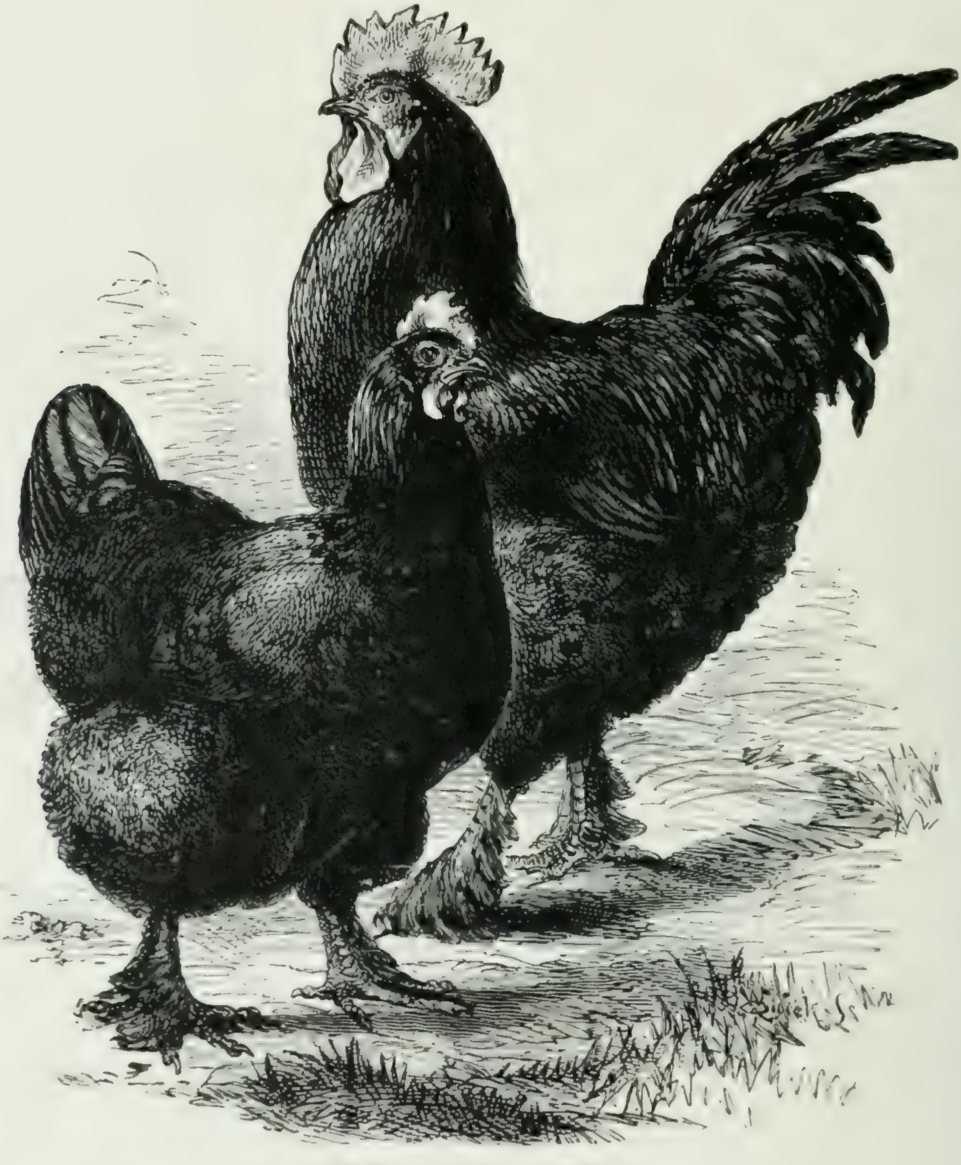
* In the last edition Miss Croad writes: "The birds pourtrayed by Mr. Gedney were faithful likenesses of a type that *does* appear, but not our favourite." The former editions stated: "The accompanying illustration conveys a very accurate idea of the style and carriage." From personal recollection, we can vouch for its entire correctness, some of Miss Croad's own birds being even more heavily feathered, and slightly vulture-hocked.

* *Cottage Gardener*, 1850.



The First or Original Langshans.

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* Miss Croad writes (*Langshan Fowl*, 3rd ed., p. 17) that if the authorities confounded the Langshan with the Black Cochin, it was because "their eyes were holden that they could not see." It is best to add no remark to this, except that the quotation marks are her own.

up to 1887,[*] though not since; the fact is that we personally noted and reported[†] cases of scaly leg in Langshans so early as the Bath and West of England Show at Oxford in 1878. It was further affirmed that Black Cochins were a mere cross-made bird, and consequently the cocks always moulted out more or less red and yellow in the feathers: it had soon to be admitted that Langshan cockerels also often came with red and yellow hackles, and it was easily proved that Black Cochins had been imported and bred pure, and as free from coloured feathers as other black fowls. This statement of a simple fact was coolly described[‡] as an "impudently false assertion," and as an "unscrupulous editorial canard" of the writer of these lines; and another concerning the dark legs of former Black Cochins was stigmatised as "effrontery" in the same coarse way.[§] Stress was also laid upon the longer tails, larger combs, gloss on the plumage, and black legs—points in which we now know there was more or less force; but which had also been found in early Black Cochins, and all of which are largely matter of selection or condition, while unfortunately no attempt was made to select types for exhibition which made them conspicuous. Instead of the gloss insisted upon, hens were repeatedly shown quite out of condition, with no lustre at all, and almost brown; a cock high and almost bare on leg would appear in the same pen as a hen very short, heavily feathered, and hocked; and amid all this confusion and absence of any type at all, judges and reporters were expected to see that which Langshan breeders could not select even for themselves.

This would speedily have righted itself as more people bred the fowl; but unfortunately the members of this peculiar cult attributed the difficulties which had arisen entirely from their own utter want of knowledge and experience to their critics, and mean motives were freely imputed in the most reckless fashion. When Mr. Ludlow pointed out, for instance, that the lustre said to be so peculiar was mainly a matter of condition, and that Black Malays and Hamburghs exhibited as much of it as Langshans, his statement of such an elementary fact was affirmed by these people to be "utterly false."

[In the last edition of this work Mr. Lewis Wright gave further particulars of the controversy which took place over a number of years, and which it is not now necessary to relate so fully.—Ed.]

Repeated appeals were made to ourselves and to the judges to "select a type," and the ideal then selected precisely describes a bird provided later in the Black Orpington. But it was not accepted, and the confusion went on, so that in 1878 Lady Gwydyr won prizes simultaneously in Black Cochin and Langshan classes at the same shows, with birds of the same breeding. Facts of this kind were no doubt annoying, and such views and arguments may have been irritating to people who knew and felt that they *had* something distinctive, in spite of it, though they could neither define it nor make others see it. But to represent it as coming from "Cochin champions," or say that it was all because the Langshan "threatened vested interests," was farcical in face of the notorious desire everywhere in the fancy, both then and now, for anything really new. The same must be said of the assertion that anything in those old days conveyed in the faintest way any imputation upon Langshan breeders of being "impostors, who were endeavouring to impose upon a credulous public." Still the bitterness of the replies to any criticism, however legitimate, greatly retarded the progress of the Langshan. People preferred to keep at a respectful distance from those who so freely indulged in fierce recrimination over differences of opinion rather than run the risks of closer acquaintance with them or their birds. Such a feeling does not further the prospects of any new breed; and it hindered those of the Langshan; but we gladly leave here this phase of its history, except so far as it had actual effect upon the evolution of the fowl itself, and upon the form which it has ultimately assumed.

Changes in Type.

That evolution is rather curious. We still continued to seek for some "type" in the show-pens, and at last, at Birmingham in 1877, while we could see no guiding standard in the class as a whole, we remarked that one pair shown by Mr. Heaselden,[*] "*if they are admitted as the type*—whatever that is—we thought the *handsomest* pen in the class." There seemed to us there something really distinctive and handsome, and which we had never seen before. At the

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[*] *The Langshan Fowl*, 3rd ed., p. 72.

[†] *Live Stock Journal*, June 14, 1878.

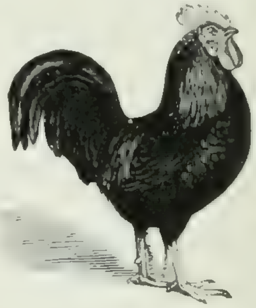
[‡] *The Langshan Fowl*, 1st ed., p. 34.

[§] *The Langshan Controversy.*

[*] We have previously stated, from recollection only, that this type was first discovered by us in birds shown by Mr. Thomson at Birmingham in 1877 and 1878. The first date being challenged by Miss Croad in regard to Mr. Thomson, we have referred to our actual show criticisms, and find that the "type" alluded to, which is the only important point, and the only one regarded by us, had been observed in regard to two other exhibitors as here stated, one having been confounded with Mr. Thomson's birds.

Crystal Palace show next year we found three pens of that same stamp, reporting of them: "Third prize [W. Morris] and 1611 and 1620 (Thomson, unnoticed) struck us as the nearest together to any real type, and one which we last year thought might possibly have given the breed some character of its own." Mr. Thomson stated next week that his birds were from a totally distinct importation of his own, a fact we were entirely ignorant of. At the Birmingham show a week or two later we noted again that "in old Langshans Mr. Croad's and Mr. Thomson's birds were the only pairs, so the utter difference in type could be seen readily." The birds referred to were very bare of feather, and had very moderate to short legs, very full breasts, and a full "flowing" tail and "sweep" of profile, which we compared to that of both the Dorking and the Hamburgh, with a justice that will be seen from the small illustration given. It rapidly became, and for some years remained, the winning type of Langshan, as exhibited by Mr. Bush, Mr. Orme, Mr. Pope, Mr. Housman, and others; and with its adoption we hoped at one time that the long controversy had been settled.

But the bitter feeling of the inner cult of this mysterious fowl—deemed "joss" or sacred in China, there really did seem something uncanny about the bird—forbade this, and the recommendation of the type was imputed to us as a fresh offence and injury. Judges in general, and ourselves in particular, had been pointedly appealed to for such a selection, and all had agreed upon this model most unmistakably; but all concerned in it were now attacked tooth and nail. Miss Croad affirmed* that our preference was expressed "as an apple of discord thrown in"; it was said that we had "attacked her yard through his" (Mr. Thomson's)†; and when later we noted similar birds as shown by Mr. Bush, we were accused point-blank of "personal hostility" for not stating a fact we could not possibly know, that those birds were from Miss Croad's own eggs, a fact we gladly published as soon as it reached us. That was the first knowledge we had of her yard ever producing this type; and when a year or two after we noticed birds of the same stamp to be now and then shown by Miss Croad herself, we gladly said so. But this proved yet another offence. She wrote at once,‡ "*This I emphatically deny*," and stated § that she had rejected all birds from eggs Mr. Thomson had sent her, "because they were *so different from my own*." However this may be, the small illustration herewith is reprinted from a block prepared for and used by Miss Croad herself to illustrate advertisements of her own stock in the year 1888, and which is the exact type we first observed in 1877. This type of bird was, however, now opposed to the bitterest extreme, for no apparent reason (since Miss Croad's own yard was proved to produce it) except that we had recommended it. She wrote admitting that our advocacy of it "certainly for a short time had the effect intended," but intimated that the victory was not won yet. And it was not. These birds were now furiously attacked as Cochiny! At the Dairy Show of 1884 the chief winners were Mr. Merton Orme and the Rev. A. C. Davies; it was said of Mr. Orme's winning pullet that "it was a decided Cochin type, short-legged, *and if more prolific in feathers might have stood for a Black Cochin;* second pretty much of the same style."* Mr. Harrison Weir affirmed that the winning cockerel had none of the Langshan characteristics, and "*would have passed muster in a Black Cochin class*."† It was proved that all these birds were of Croad blood, absolutely uncrossed; and such reckless assertions are a truly curious commentary upon the many previous statements that there was nothing in common between Langshans and Cochins!



As Advertised by Miss Croad, 1888.

Reaction and Further Change.

All this is only important now, because it affected the Langshan itself profoundly. For it succeeded, and stamped that type out. The inner circle, whose vehement zeal finally achieved this result, bred for more and more height of leg and of tail, and carried those points. When they had succeeded in this, and the deep-bodied and short-legged model had been fairly displaced, an astute breeder and dealer who saw its superior merits, stepped in and appropriated the type, only with clean legs, for his so-called Orpingtons. After that Langshan breeders were compelled to breed away from the Orpington, as well as from the Cochin, and it was inevitable that points as opposite as possible to both breeds should be more and more encouraged, and the result is the Langshan of to-day.

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* *Live Stock Journal*, June 27, 1884.
† *Poultry*, June 4, 1886.
‡ *Ibid.*, May 7, 1886
§ *Ibid.*, June 4, 1886

* *Live Stock Journal*, October 10, 1884.
† *Ibid.*, November 7, 1884.

The Modern Langshan.

We still think that the more Dorking-like type of bird *was* a better model, from at least the utility point of view. It carried more meat, and was not subject to leg weakness, as all long-limbed breeds are; when tight-feathered it was as good a layer; and it presented a better appearance on the table than the long-limbed birds now bred.* But the change became inevitable under the circumstances; and the merits of the modern Langshan are great enough. Its white skin and meat, its hardiness, its fine laying capacities (which have become more uniform since tight feather was made a *sine quâ non*) and its noble appearance, are all in its favour. It has been alleged to be crossed with the Indian Game, and we should not like to pronounce absolutely on that question: our own impression is that some specimens may have been, while others probably are not. We have seen in a few examples a *narrowness* and hardness of feather not seen in others, which is suspicious; and in such a bird we once noticed several feathers with a kind of *lacing* of distinctly superior iridescence. Such a fact is very significant in regard to such specimens; but others we have carefully examined betrayed no such signs, and their points embody nothing beyond what steady breeding could effect in a race of such compound and therefore plastic nature, and which would respond so readily, as the Brahma also did, to selection by man of one or other of its contending types.

That the Langshan is such a breed must be obvious. That there is ample Shanghae element in it, is on the very surface; we have seen that the very people who so furiously denied it, did not scruple to brand as "Cochins" the uncrossed produce of their own birds. But there is in the bird at least one other element, and perhaps more—some strain of dark blood, of a very peculiar stamp, seen in the rich brown eye, the tendency to purplish face, and the peculiar crimson tinge between the toes. The latter colour was the first *characteristic* point we were able to observe; but curiously enough, when we pointed it out as really *sui generis*, this was denied, and it was said to be merely due to "thin skin"; the utter incapacity of early Langshan advocates to see what there really *was* in the fowl, is one of the strangest things about the whole business. The nearest other exponent of this peculiar, dark, and sprightly element, comparatively pure, seems to be the Black Java of America,* which has the same dark eye and alert disposition; but it does not follow and is not meant that the present Java was the real progenitor, or that there has been any recent cross. The probability is rather that some dark-blooded race from which the Java also is descended, long ago amalgamated with the Shanghae. During late years the Chinese appear to have bred for black colour alone, which would lead to great variety in other points, such as combs, leg-feather, top-knot, etc., and the various components would come out under selection, exactly as in the case of the Brahma already discussed.

We come now to the Langshan as it is, and its breeding. The following remarks have been kindly supplied by the Rev. A. C. Davies, of Antingham Rectory, North Walsham, Norfolk, one of the oldest breeders, and are very interesting historically, as well as for the details they convey, though we do not think, as above intimated, that some at least of the discarded type could be justly described as either Cochiny or loose in feather.

"Having been a breeder of the Langshan for upwards of twenty years, it has fallen to my lot to see the change in type from the looser feathered bird to that of the tighter and closer feathered one of the present day. Many fanciers were not satisfied about the year 1884 with the bird then winning in the show pen, some saying that the true Langshan was or should be a bird of tighter feather and more alert in appearance and general bearing, in contrast to the then "Cochiny" type seen at the exhibitions. The idea took hold quickly, breeders evidently thinking that a bird of this class would become more popular, and prove more useful so far as the economic properties of the breed were concerned. However, it was not until the Palace Show of

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* Writing in 1911, when these pages were submitted to him, Mr. Harry Wallis, of Warley, Essex, says: "As regards this point, I find my birds are better breasted than when they were shorter on the leg." The utility qualities of the type are also upheld by other breeders.

* Miss Croad maintains that the Langshan made the Java, adding that we do not "seem to be aware" that the Java is a "made" breed, as she learns from various American papers. We prefer more original information than recent American papers, and the Java is mentioned in Dr. Bennett's *Poultry Book* of 1851 as then known in America, from direct importations, some of them being occasionally called Malays. The Java always bred truer to type than the early Langshans ever did until breeders who really knew what type means had produced some uniformity in them.

1889, that any improvement of a decided character took place, when birds of the closer type came to the front and swept the deck consistently for the first time. The change, I well remember, caused quite a flutter of excitement amongst exhibitors, and of course did not please them all; but the majority were satisfied at the turn things had taken, and it may be said that from this time forward the new and improved type made progress. The ideal might have been reached more quickly had it not been that most of the judges would not forsake their old love for the new, but still gave the prizes and honours to the old and now discarded type—in fact to that which the prominent Langshan breeders were determined to give up, and contrary to the standard of the Langshan Society. This retarded matters from proceeding as fast as the Society desired, and it was not until specialist judges came more into vogue, who understood better what was wanted, that matters were placed on a more satisfactory basis, the result being that now, through perseverance and in spite of much difficulty, many are the birds, both in and out of the show pen, that are to be found bearing the stamp the standard requires. The Palace Show of 1900 confirmed this in some measure. At that show the judge had no difficulty in being consistent in his awards, and placing birds of the correct style in the front ranks. It is to be hoped that this satisfactory state of things will continue, and that the novice will not be so perplexed in the future as he has been in the past, but that now there is some fixity of type, his many difficulties as to what to breed for will be overcome.

"It may be helpful to many to make a note of some of the chief points a Langshan should above all possess. Richness of colour, I think, stands first; for the chief beauty of the breed lies here, and gives it a charm which is most attractive. This colour should be a pure black, with a metallic sheen of beetle green, the richer and greener the better, and any birds with even a suspicion of blue or purple in their feathers should be set aside or consigned to the kitchen. It has frequently been stated that breeders run the risk of spoiling the useful properties of the Langshan by breeding too much for colour; but this, as far as my own experience goes, is a certainly mistaken view, for I have always found that those birds are invariably the best layers which carry lustre of plumage in a very high degree. It is thus satisfactory to know that we can safely combine beauty with usefulness, without there being the least danger of impairing the prolificacy of this handsome and beautiful bird.

"The plumage, besides being pure in colour, should be tight-feathered all through, and especially so if anything, over the back, without any suspicion of cushion. Down and around the thighs it must be the same, fitting down if possible more closely and evenly over the hocks, and from thence passing into a fringe of feathers down the shank to the end of the outer toe. Feathers on the middle toe should be carefully avoided.

"In regard to the eye, this must be almost black in colour, or at least a very dark brown; any yellow, orange, or mottled colour being a great disfiguration and blemish. The young fancier should be very particular in selecting birds for breeding that are especially strong and first rate in this respect.

"The legs and feet are of a dark slate colour, and the skin between the toes of a vivid and delicate pink, and the toe-nails white. The beak is of horn colour, dark at base but running off into a lighter shade. Combs, face, and wattles all should be a very brilliant red. For the rest, I think with the aid of the Standard, and the illustration of the pair of Langshans before him, the amateur will gain all the theoretical knowledge he requires. He will observe at first sight that the bird is tall, upright, of alert and active appearance notwithstanding its size, and in type also the birds are as nearly as possible a faithful representation.

"There is one point upon which it is necessary for me to issue a word of warning, as it is one whereby the perfect symmetry of the bird is endangered. There is a tendency in my opinion to get it *too* long on shanks and thighs, and especially the latter. A moderately and only fairly long shank and thigh should be bred for, otherwise one gets a bird out of proportion at once, and with no counterbalancing advantage. There is not a shadow of a doubt that length of leg is rather overdone in some birds, and there being neither beauty or usefulness in it, a compromise might with advantage be effected. It is a point that might well be conceded with profit, for besides being a direct improvement to the bird itself, it would gather many more fanciers into the ranks of the Langshan Society, and gain a larger number of admirers.

"At any rate, despite one or two weak points, which I feel sure in course of time will be rectified, the modern bird is far and away superior to the old type in nearly every respect. As it stands it is a fine, useful, and profitable fowl, with great beauty combined. With more activity and more inclination to ramble and forage for themselves, they have become more interesting, for they make the poultry yard full of life, while the grace and dignity with which they carry themselves is both charming and attractive. All this has not been gained at the expense of their useful qualities, for as layers and table fowls they have never been better, and while they lay in great abundance, their eggs are of a good size and of a most delightful colour, ranging from a delicate salmon pink to a rich chestnut brown, and form a most tempting accompaniment to the breakfast table. With regard to their size I have this testimony from America, where I understand the old type still prevails. A gentleman writing to me says: 'I am more than pleased, and wish to compliment you on the splendid large eggs, *the largest from Langshans I ever saw on the average.*' This is quite a feather in the cap of the English breeder, and for the modern type, coming as it does from a country where they are generally prepared to 'lick creation,' and have in the main hitherto preferred another type of bird. As a general all-round fowl, too, they are excellent. I know of none better, and I have tried many. They are not frequently broody, yet they make the best of mothers; the chicks (which hatch half white) are easy to rear and are very strong; in fact there is no reasonable test that the Langshan will not stand, and come out of it with great honour and credit to itself."

The following additional notes are kindly supplied by Mr. F. Onslow Piercy, of The Elms, Lowthorpe, formerly one of the most successful exhibitors of the modern type of Langshan, and whose remarks upon its economic qualities are especially worthy of attention.

"Perhaps a few remarks on the Society type of Langshan from one who has bred and studied the breed for many years, may possibly be of some use to persons who contemplate going in for that type. In the first place I ought to say that originally I produced my Society type of Langshans from the original, by careful selection in picking out the tallest, finest boned, closest feathered, best coloured, and most stylish looking birds, and breeding from them. Most breeders will be aware that many different types may be produced from any breed; it is only a matter of time and selection in mating the breeding pens, choosing the birds most likely to produce the type you are aiming for. Briefly, the difference between the original type as imported from the Langshan district, and the modern type, is this: the former is shorter and coarser in bone, much looser in feather, carries much more fluff, and is coarser in feather on the shanks and toes; also the feather about the hocks is very much heavier; the body is shorter, and the colour too is not so brilliant as the later type of Langshan.

"The latter is a tall bird, with a nice length of shank but medium length of thigh, sufficiently strong in bone to carry the weight of the bird, neither too coarse or too fine; good length of body, with a long, deep, and well rounded breast. It is close in feather and of a brilliant green colour, free from purple; a tall, stately, deep-breasted bird, with a beautifully rounded outline and good upstanding carriage, in proportion all round, and not a bird that strikes one as being excessively leggy, neither should it have a cut-away appearance in the breast, as some specimens have. I consider there is nothing handsome in a Langshan if you can almost draw a straight line from the head right along the keel without catching the breast. The scales on the shanks, etc., of young Langshans, till after the adult moult, should be nearly black, turning paler afterwards. The shanks and outer toes should be nicely, although not too heavily feathered, the shoulders should be broad, the shanks set well apart and the tail carried slightly elevated, and in the case of the cock should have an abundance of green side hangers, and of course the two sickles projecting beyond the rest; the eyes dark, face and comb brilliant red; the latter firm, erect, and evenly serrated. The cock should be fairly long in the neck, with a full and well rounded hackle. Nearly all of the best Langshans show red between the toes and the scales down sides of shanks, especially the male birds.

"In breeding Society type Langshans, I prefer to breed from two-year-old hens, although I have bred some of my best pullets from first season hens. I would choose large but not coarse boned hens (there are many modern Langshan hens weighing over 10 lbs. each, and not a bit coarse in bone for their size), as green as possible in colour, with shanks well apart, broad across the shoulder, and with a long deep breast and good length of back, close in feather and of good carriage, well, although not too heavily feathered on the shanks and outer toes, and as dark as possible in the eyes; with neat, small, firm, erect, and evenly serrated combs if for pullet breeding, but for breeding cockerels it does not signify so much if the breeding hens' combs are large and loose, so long as they are evenly serrated.

"I may say at once that there is not the slightest necessity to have two pens for breeding cockerels and pullets, as one pen can undoubtedly breed first-rate birds of both sexes if correctly mated; but occasionally one has a good hen with a large loose comb. Such a bird is not suitable for pullet breeding, but it is quite possible that she might breed some grand cockerels if of good shape, size, colour, etc. In choosing a male bird to mate with the hens, I should prefer to use a cockerel or two-year-old cock, a tall, stylish, well-shaped bird, close in feather, as green as possible in colour, fine in bone, dark eyes and brilliant red face and comb; the latter firm, erect, evenly serrated, and back part of same carried close to the head. The male bird should be very stylish and have as green a tail as possible, legs perfectly straight, and shanks set well apart. The shanks and outer toes should be well feathered, but the feathers not coarse. Any fault which the hens may have must be counterbalanced by the cock.

"It is quite possible to breed good-coloured Langshans supposing the hens are short of colour, if mated to a grandly coloured cock, but I think it is most important in order to breed good-coloured Langshans that you should have the colour to start with on one side, either in the cock or the hens, the former for preference. Of course, if you have colour on both sides so much the better. You must breed for colour, and will not get it by feeding, only so far that by good feeding you improve the condition of your bird.

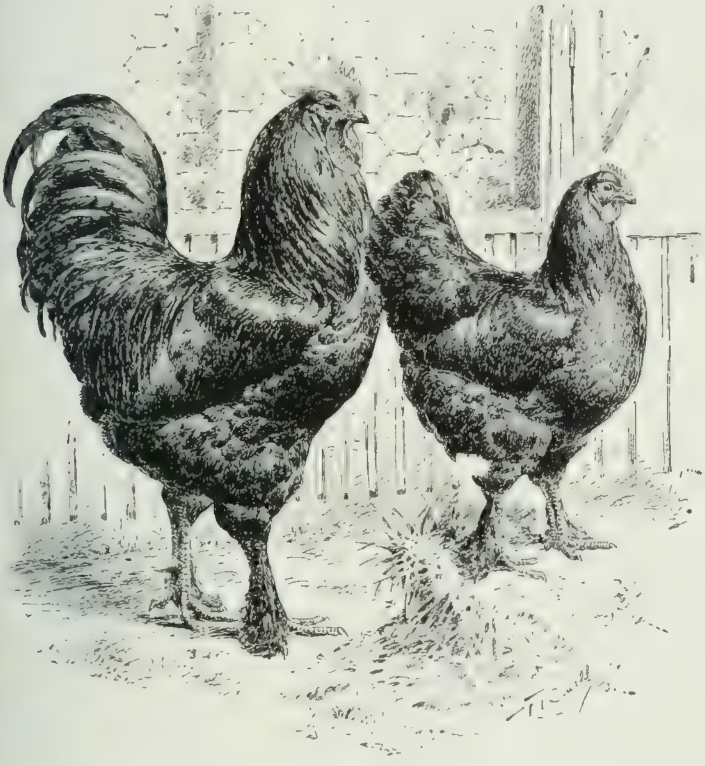
"The modern type Langshan I find is a splendid winter layer. I have one large pullet in a run alone (as I was anxious to breed a few cockerels from her) and for a long time she has been laying splendidly. She lays for nine days as a rule without a miss, she then misses one day and starts again, and she has been laying like this for weeks. Then as regards table birds, not many breeds can surpass this type of Langshan. In the autumn I sent twelve of my Langshan chickens hatched late in April to market, dressed, and the twelve averaged slightly over 6s. 8d. each; the four finest were sold at 8s. each, and this in a market where the top price for ordinary fowls was 5s. *per couple*. The above average broke my record in 1899 of 13s. per couple for the best table birds.

"Langshan chickens are very hardy, and are very easily reared, and as all breeders of Langshans know, are black and yellow when hatched. Generally speaking, the yellowest chickens turn out the most brilliant coloured birds. Langshans require practically no preparation in order to exhibit them. Mine are in no way treated differently during the show season, from any other time of the year. Of course the legs, faces, and combs require washing before sending to a show, and it is a good plan to stroke the birds down with a silk handkerchief when in the hampers before sending to a show, but nothing further is required."

These notes, from two such representative breeders, leave us practically nothing to add, but we may perhaps make one remark upon breeding for colour. There is no doubt that green parents on both sides are far the best. But there is also no doubt that in glossy green-black fowls, the male offspring of glossy pullets often show red in the hackles; and if there is no other promising stock available, the experience of Hamburgh breeders goes to show that such a red-hackled cock, bred from a good hen or pullet, may be used for imparting gloss and green colour to his female offspring. His cockerels will be red, and this red gives a great deal of trouble to breed out when once introduced directly; hence the desirability of avoiding it and using green stock on both sides; still there may be cases where the knowledge of such facts may be useful in pullet breeding.

In regard to the plate which illustrates this chapter, both Langshan breeders and ourselves are under special obligations both to the artist and to Mr. G. Fielder. Mr. Ludlow's first sketch was based upon various photographs supplied by Mr. Fielder, and all subsequent slight modifications in detail were made under the patient criticism of that gentleman, conveyed to us personally with the actual birds before us, and illustrated and justified by yet further photographs, in a manner which cost the artist also an amount of time and trouble quite unusual. But after all that had taken place previously, no pains were thought too great by all parties to procure unimpeachable representation of the type now recognised by a majority of Langshan breeders; and it has been a satisfaction to all concerned to have received already most emphatic approval and endorsement of it by those interested.

In America the Langshan is bred to an older type; not to that we had advocated and shown in the small block on page 282 from Miss Croad's advertisement, but with the somewhat greater length of limb and higher and taller tail which first began to supplant it, before the reaction had become fully developed. In all points, save a few minor details, the American Langshan as now bred resembles the type known in Great Britain as "the Croad," since, in 1904, the Pure (Croad) Langshan Club adopted as the model for which its members were to strive an illustration representing the type in vogue in the United States, and of which the accompanying illustration, from the pencil of Mr. Franklane Sewell, in the *Reliable Poultry Journal*, gives a very fair idea. The model may probably be taken as representing also the ideas of those in England who look askance at those specimens of the Langshan that conform to the type required in the Langshan Society's standard of excellence. As a matter of fact, there is not such great dissimilarity between the two types as is popularly supposed, the only real differences being found in the weights, length of back and shanks, carriage of tail, and character of plumage; and a glance at the standards reveals the fact that they are compiled on very much the same lines. A comparison of the illustrations on pages 280, 282, on this page, and in the plate, will amply bear out our remarks upon the character and plasticity of the original stock.



American Langshans, 1898.

That plasticity is in fact amply sufficient to account for all the modifications of type which have been here reviewed, without any offensive imputations of a "mongrelism" which is at most doubtful, and quite unnecessary to suppose. Not only have we the assurance of gentlemen, as above, that their birds have been modified in type simply by the well-known processes of selection, and not only was the process carried at least half-way by the very people who now severely condemn its result when merely carried somewhat farther, but the converse still holds good: birds can still be selected from almost any yard which would breed the American ideal as here illustrated. So lately as the spring of 1900, Mr. F. O. Piercy informed us he was able to send out to his brother in Canada a pen of Langshans, bred from cup-winners at the Palace and Society shows, but selected to suit the American standard, of which the cockerel was passed for insufficient feather on outer toes, but the females took the highest honours possible, and one of them in addition the medal for the highest scored bird in the show. These birds, in their new quarters, would breed produce according to both English and American ideals.

White Langshans.

White Langshans appear to have originated with Mr. R. J. Pope, of Barcombe, near Lewes, who was at the time (1886–89) a very successful exhibitor in the Black Langshan classes. The propensity of the original Black Langshan to produce white feathers and occasionally white splashes, has been already noticed; and one of these mis-marked birds in Mr. Pope's yard produced one or two pure white pullets. These were bred with one of the black cocks, and by carefully breeding selections from their produce, a White variety was established, so that at the time of a visit we paid to Barcombe in 1888, a flock of about seventy white birds was in existence. This flock is the origin of the White Langshans; but the well-known strain of Mr. Will Smith was, we believe, originated quite independently in 1896 or 1897 by sports from Black Langshans procured from Mr. Stirzaker, a well-known breeder of the Black variety. The white is not an "albino," birds or animals of that curious type having pink eyes, which the White Langshan has not; it is a white variety, as in the case of Cochins, derived from sports whose history we have shortly given. The variety gives an interesting incidental proof of what we have stated above concerning the intimate connection between colour of plumage and colour of shanks; the scales on the latter having become a pale blue-grey, and the crimson between them assumed a paler pink shade, though distinct from that of the white Dorking. A curious thing is that when these white birds sported back to black, as they often did at first, and still do occasionally, these black sports revert to the usual colour of shanks and beak in all respects. The following notes on White Langshans were kindly contributed by Mr. W. B. Westlake, of North Walsham, well known as a breeder of this variety:—

"Although this breed originated about 20 or 25 years ago, it has made but little progress amongst fanciers, which is a great pity, as it is one of the handsomest and hardiest white breeds we have. In shape and general characteristics it is exactly like the Black Langshan, from which it is a sport, differing only in colour. As a layer it is quite equal to, if not better than, the black. The eggs from the pullets are larger, averaging 2½ ozs. in weight, and are of a beautiful brown colour. The hens are reliable sitters and good mothers, but are apt to break an egg or two, as they are heavy birds. The chickens hatch out a dirty grey colour, and like their relations the Blacks, feather rather slowly, but nevertheless they are strong, and thrive well even in the coldest weather, providing they are kept dry and sheltered from the wind. If required for exhibition they should be hatched during January and February, and for winter laying not later than the middle of March, as they take rather a long time to mature. About the middle of February is the best time for hatching, for both purposes.

"The average weight for full grown birds is, cocks 9 lbs. to 10 lbs.; hens 7 lbs. to 8 lbs. The cocks have been known to scale 14 lbs. The colour is as follows: the beak should be white, with a pinkish shade near the lower edges. The legs and feet are light grey or slate; the scales rather loosely put on, thus showing the pink skin between. The plumage is pure white all over, the upper parts, wings, and tail glossed over with a brilliant silvery sheen.

"As a table fowl these birds do not rank high, owing to their being rather slow growers, but at the same time they are excellent eating, there being an abundance of white meat on both breast and legs. I believe a cross with the Houdan would be admirable for market purposes, as they would be ready for the table weeks sooner, and still retain the juicy white meat on the breast. For this cross I should recommend using the Houdan cock on white Langshan hens, and not a white Langshan male."

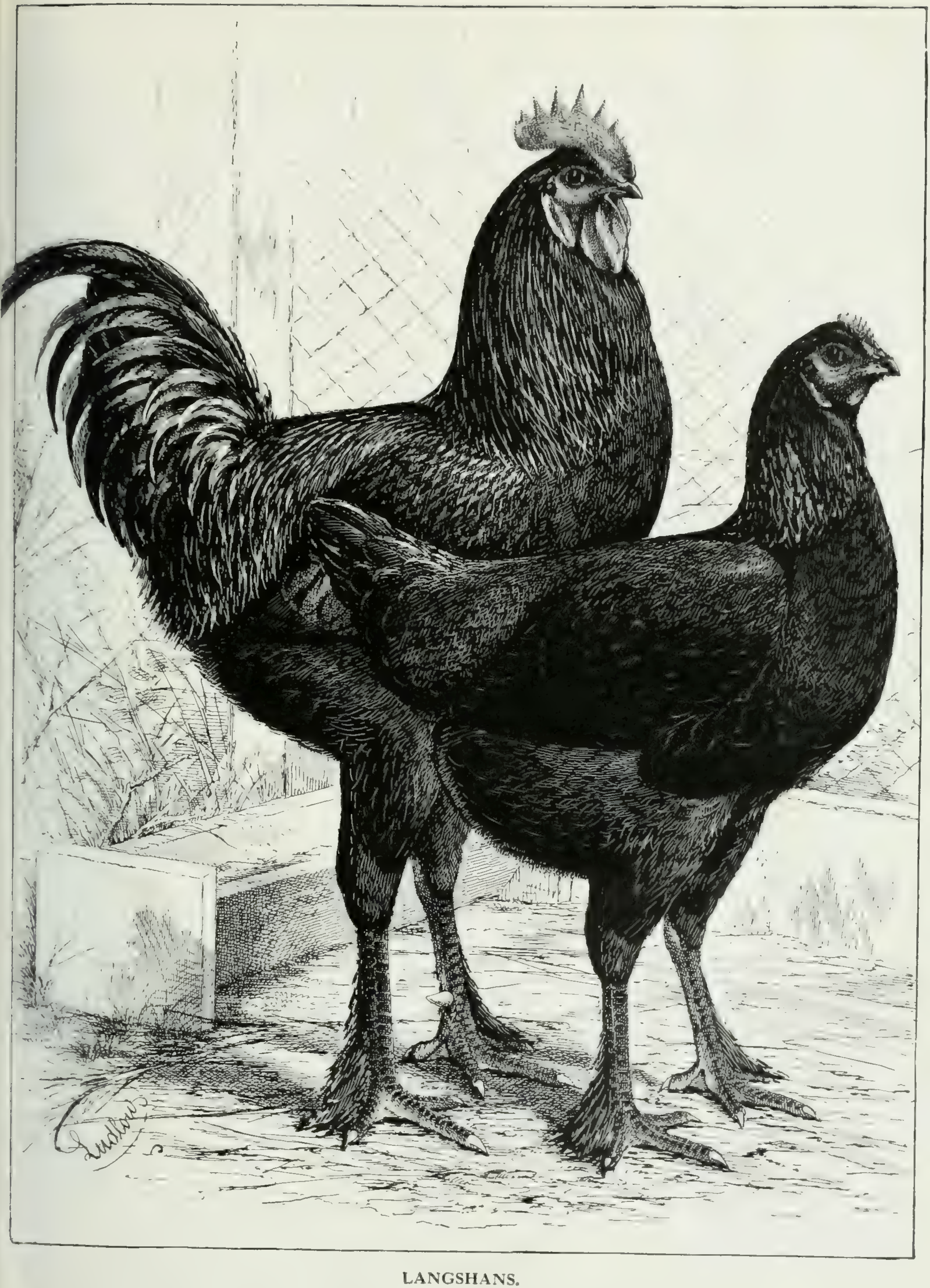
The White Langshan has some points which make it peculiarly suitable for such breeders as like a white fowl. It is very large and hardy, with good flesh and a beautiful skin; a good layer; and its close and hard plumage enables the White to keep cleaner than some other breeds. Like the Blue, it is sometimes shorter in leg than the prevailing type of Blacks, having sported and been developed at a period when less length of limb was the accepted model; but the modern type is being more and more bred up to, and some winners lately have been quite as tall as the older variety.

Blue Langshans.

When once really kindred black and white varieties of a breed are in existence, it only requires breeding together, to produce sooner or later the colour known as blue, blue-dun, or Andalusian. It is a mere matter of choice or experiment. This line of breeding was taken up by Messrs. Kirby and Smith, of New York, in the case of the Langshan, and their first Blues were exhibited at Charleston in January, 1890. They had taken five years to get the colour presentable, aided in some degree by a blue "sport" from pure black raised by a Mr. McLean of Connecticut. The first specimens that appeared in England were sent from Mr. Smith to Mrs. Sismey of Rutland, who disposed of the stock afterwards to Mr. Shelton and Mr. W. A. Jukes, all eventually finding their way into the yards of the latter; and another pair, from Mr. Bradbury of New York (but also from Mr. Smith's yard originally), was also sent to Liverpool Show in 1893, and there purchased by Mr. Jukes. From these two importations probably all, and certainly most, of the present stock in England is derived. They are beyond doubt true Langshans, bred between black and white without going outside the original breed. The following notes are kindly supplied by Mr. W. A. Jukes, hon. secretary of the Blue Langshan Club:—

"Since the last edition of this work was produced, a great change has been wrought in the appearance of the Blue Langshan; not only has the colour been intensified, but the type has been altered from the feathery, cobby type, as originally introduced from America, to the tight-feathered, upstanding type now generally recognised as the Modern or Club type. The accompanying illustration of a cockerel bred and exhibited by me will show this very clearly, and it is not too much to say that in this respect the Blue is quite equal to its older brother, the Black.

"This change has been partly brought about by occasional crosses with the Black Club type Langshan, selective breeding having done the rest. Fresh blood was, of course, necessary, not alone for vigour of constitution, but also in order to keep up the colour, and as this was produced in the first instance from the



LANGSHANS.

union of Black and White, the Black Langshan was naturally selected for the purpose; and as my own predilection was for the Club type, in preference to that known as the Croad type, it was to that I turned; but there can be no doubt that it would have been just as easy to breed the Blue Langshan to the Croad type had I so desired.

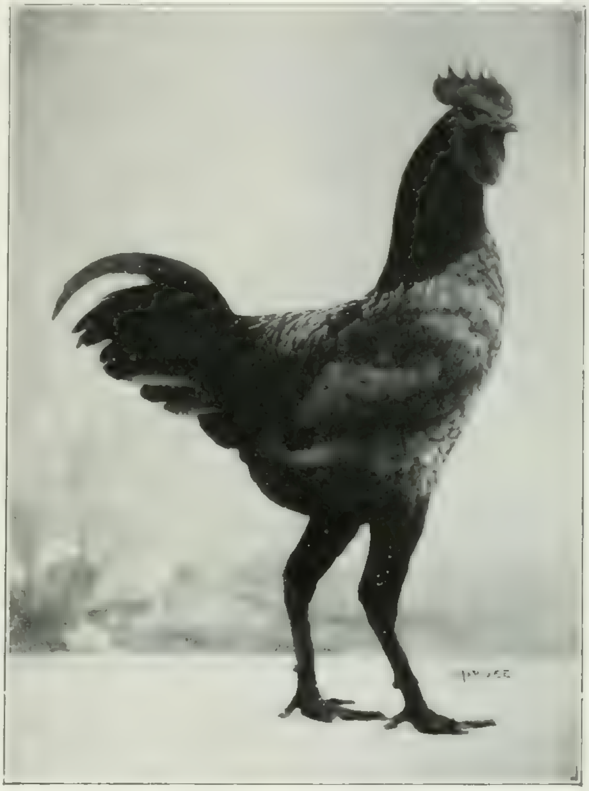
"A few words as to colour may not be out of place here. Of the original importations and their progeny, I found that those which were of the rather pale shade, level throughout, without lacing, and only slightly darker in the upper portions of the cocks, very quickly faded in the breeding pen to a dirty smoke-colour, whereas those which showed some indication of lacing resisted this fading process considerably longer. The upper portions of the cocks were also much darker.

"I argued from this that Nature's preference was for laced Blues, and determined to breed accordingly. We have not yet been able to arrive at anything like the clearly defined lacing of the Andalusian, but I think this is largely accounted for by the fact that the Blue Langshan has so far been in a comparatively few hands, and consequently each breeder's field of choice for his matings has been too restricted, which, again, has meant that recourse has had to be made to the Black for fresh blood more frequently than would have been necessary otherwise.

"Now that more breeders, especially breeders of experience like Mr. Harry Wallis, have taken them up, and the type has become fixed, I am hopeful that we shall see rapid strides made in the near future in this point of colour and lacing; but more are needed, and I can confidently recommend this variety to anyone wanting an interesting and fascinating hobby, the results from which will handsomely repay the time and thought and trouble expended upon it.

"I am convinced that no real progress is possible on the lines of solid colour without lacing, and I am sure that those breeders who are attempting to breed other Blue varieties on these lines will eventually come to agree with me. It is hardly possible to write anything on the subject of Blues without referring to Mendelism, as the breeding of Blues is a classical instance quoted in all works on the subject; and while I cannot go so far as to state that the percentage of Blues is 50 against 25 Black and 25 splashed Whites in every 100, I can warn breeders that they must be prepared for results, if taken over a number of years, approximating to those figures.

"In this connection it may be interesting to readers to know that whenever I have mated a Black Langshan male of totally unrelated blood to the splashed White females thrown by the Blues, I have almost invariably had results entirely Blue, though the lacing was not always so perfect or so clearly defined as from Blue parents on both sides. On one occasion I used a male bred from a Black mother by a Blue father; he was very dark, but still a Blue. I mated him to splashed Whites, but the results were nothing like so good as when, later in the year, I put an unrelated Black male with the same females.



Blue Langshan Cockerel.

"As for the vexed question of double mating, *i.e.*, of Cockerel-breeding and Pullet-breeding pens, I have not found this necessary, and have never attempted it. Whether, as further progress is made in the direction of clearer ground colour and deeper lacing, such as in the Andalusian, this will become necessary, time will prove, but I sincerely hope not, as it is an undoubted bar to popularity.

"In utility qualities, whether as egg-layers or as table fowls, there is nothing to choose between Blues and Blacks; both in size and tint their eggs are alike, and the flavour and texture of the meat, if given time to come to maturity, is unsurpassable.

"To come now to Club matters. The old Langshan Fanciers' Association, itself a successor to the original Variety Langshan Society, has, since the date of the last edition of this work, been dissolved, the Whites being taken over by the Langshan Society; and a new club, called the Blue Langshan Club, of which I have the honour to be secretary, was formed to look after the interests of the Blues, the standard adopted being that of the Poultry Club, which is practically the same as the Langshan Society's standard. There is thus every inducement for breeders to take up the variety, which, for the sake of its improvement, I trust they will do."

Buff "Langshans" have been advertised, but only by individuals who advertise buffs of all possible descriptions. Whatever differences have existed amongst Langshan breeders, all would agree that black and white were the sole components of the fowl, with any legitimate product of these alone; and any buff colour must denote a mere mongrel of quite recent making. The only other colours that could occur amongst the pure race might be cuckoo or barred plumage, or white mottling on black; both of which might possibly occur, arising also occasionally from breeding black and white together. Such colours do not, however, seem to "hit" well with the general make of this fowl, and need not be discussed.

The following is the Standard of Perfection of the Poultry Club, being adopted (except in being rendered into the general pattern adopted for all its Standards by that Club) as that of the Langshan Society.

LANGSHANS (SITTERS)

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Fine. *Beak :* Fairly long and slightly curved. *Eyes :* Large. *Comb :* Single, medium size, straight and upright, of good substance and fine texture, and evenly serrated (five or six spikes). *Face :* Of fine texture, and smooth. *Ear-lobes :* Of medium size, pendant, and inclined to fold. *Wattles :* Of medium size and fine texture, neatly rounded.

Neck.—Fairly long, broad at base, and covered with full hackle.

Body.—Full and deep breast; long and broad back, horizontal when in normal attitude (the saddle abundantly furnished with hackle, close fitting, and not too long); broad shoulders; and large, closely carried wings, though not "clipped up" or "pinched in."

Tail.—Full and flowing, spread at the base, fairly high, but with no approach to "squirrel" carriage, furnished with abundant side-hangers and two long sickles, each tapering to a point.

Legs and Feet.—*Legs :* Thighs not too long, but well developed and wide apart, and covered with closely fitting feathers, especially round the hocks; shanks rather long, strong, but not coarse boned, and having an even fringe of feathers (not too heavy) on the outer sides. *Toes :* Four on each foot, long, straight, and well spread, the outer toe (and that alone) being slightly feathered.

Carriage.—Graceful, upright, and alert, strong legged, and with the bearing of an active bird.

Weight.—10 lb.; cockerel, 8 lb.

Plumage.—Close and smooth, but not so hard as in the Game fowl, and with very little fluff until after the first moult.

HEN

With the exception that the *Tail* is not carried so high the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences. It might be added that the hen's shape should be "free from lumpy or squat appearance," and that her back should be devoid of cushion, or fullness at saddle.

COLOUR

THE BLACK

Beak : Dark horn to black. *Eyes :* Dark brown to black—the darker the better. *Comb, Face, Wattles, and Ear-lobes :* Brilliant red. *Legs and Feet :* Dark grey, with black scales in front and down the toes (losing their density after the first moult), showing pink between the scales and on the skin between the toes, especially down the outer sides of the shanks. *Toe-nails :* White. *Under-foot :* Pink-white. *Skin :* Of body and thighs, white and transparent.

Plumage.—Black, with brilliant beetle-green sheen.

THE BLUE

Beak : Medium to dark horn. *Eyes :* Dark hazel to black—the darker the better. *Comb, Face, Wattles, Ear-lobes, Legs and Feet, Toe-nails, Under-foot, and Skin :* As in the Black.

Plumage of the Cock.—*Hackles, Back, Tail, Sickles, Side Hangers, and Wing-bow :* Rich deep slate, the darker the better, with brilliant purple sheen. *Remainder of Plumage :* Clear slate blue, each feather distinctly laced (edged) with the same dark shade as the back, the contrast between the delicate ground and the dark lacing to be well defined.

Plumage of the Hen.—Clear slate blue ground, each feather (except on the head and upper part of the neck) distinctly laced (edged) with dark slate, the contrast between the ground and lacing to be well defined. The small feathers on the head and upper part of the neck, a rich dark slate.

THE WHITE

Beak : White, with a pink shade near the lower edges. *Eyes, Comb, Face, Wattles, Ear-lobes, Toe-nails, Under-foot, and Skin :* As in the Black. *Legs* *and Feet :* Light grey or slate, showing pink between the scales and on the skin between the toes.

SCALE OF DEFECTS

In head properties	*Deduct up to*	15
General coarseness	,, ,,	15
In legs and feet	,, ,,	10
In plumage	,, ,,	10
Too much fluff	,, ,,	10
Want of size	,, ,,	10
Want of condition	,, ,,	10
Bad carriage and shape	,, ,,	10
Crooked breast	,, ,,	10
		100

Serious defects : Yellow skin ; yellow base of beak ; yellow or orange-coloured eye ; yellow around the eye ; yellow on shanks or under foot ; legs other colour than standard ; shanks not feathered ; more than four toes ; permanent white in face or ear-lobes ; comb other than single ; wry tail ; "squirrel" tail ; coloured feathers other than mentioned in the standard.

Faults : Absence of pink between toes ; feathering on middle toes ; outer toes not feathered ; too scantily or too heavily feathered shanks or outer toes ; twisted toes ; short shanks ; crooked breast ; twisted or falling over (lopped) comb ; side sprigs on comb ; general coarseness ; too much fluff ; purple sheen (in Blacks) ; yellow shade or sheen (in Whites).

THE CROAD LANGSHAN

In previous editions of *The Book of Poultry* this important section of the Langshan family has had to be content with but scant notice beyond the discussion in the opening pages of this chapter as to the causes which led to the production of the two types of the breed, now known as Langshan and Croad Langshan. With the present wide popularity of the latter variety, due largely to its utility properties and also to the better spirit now prevailing amongst all sections of Langshan breeders, we have thought it desirable to give Croad Langshans separate treatment, and Mr. Herbert P. Mullens, Hon. Secretary of the Croad Langshan Club, has very kindly contributed the following notes on the breed :—

"The Langshan fowl was first imported from the Langshan District of North China by the late Major Croad, of Durrington, Sussex, in the year 1872, and at that time there was much discussion as to whether it was a distinct and pure breed, but eventually it was clearly proved that the new importation was not only a distinct breed but one of exceptional merit for utility purposes.

"There were two distinct types, one tall and reachy and the other of medium height with full flowing tail, and these two types have been accentuated by their respective admirers.

"It is with the latter of these types that this article deals—namely, the Croad Langshan; the prefix 'Croad' was given to this branch for two reasons, firstly, to distinguish them from the tall, reachy type, and, secondly, as a perpetual reminder of the debt that poultry keepers owe to the late Major Croad for introducing such a useful and ornamental breed, and to the late Miss Croad for the way she championed the breed through good and ill report.

"In colour the Langshan is a dense black throughout, with a brilliant beetle green gloss upon the plumage; a flat and broad-shouldered bird, with a deep, long meaty breast supported by legs of medium or sufficient length to give a graceful carriage to the bird; the legs are feathered down the outer sides and toes, but not heavily. Adults weigh about 9 lb. in cocks and 7 lb. in hens. They are good table birds, possessing flesh which is exceptionally fine in grain and very juicy, very much resembling that of the Houdan; the skin is very white and thin. But their chief call for public favour is their exceptional egg producing qualities, especially during the winter months; the egg is brown, varying in tint from very dark to a medium shade. Some of the eggs are far darker than those laid by any other breed.

"As an exhibition bird the Langshan first appeared in separate classes at the Crystal Palace in 1876; and though for some years the Croad Langshan was seldom seen at shows, of recent years, since the formation of the Croad Langshan Club, it has been steadily advancing in public favour, both as regards numbers and quality, until now at all the big shows well filled classes are to be seen. In a nutshell, the Croad Langshan is of such all-round excellence that it must always appeal both to the show lover and utility fancier."

Subjoined is the Poultry Club's standard of excellence based upon that approved by the Croad Langshan Club, and, we may remark, considerably condensed therefrom. Breeders of the Croad Langshan will therefore do well to also secure the fuller form from the club's secretary, especially when exhibiting under club judges, for faults which figure as "Serious defects" in the Poultry Club standard are "Disqualifications" in the Croad Langshan Club standard, for instance: "Yellow legs, yellow at base of beak, or around eye, permanent white in ear lobes, slate or blue legs in young birds, white feathers in adult fowls, coloured feathers, decided blue or purple sheen, or barring, and wry tail."

CROAD LANGSHANS (SITTERS)

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Small, and full over the eyes. *Beak :* Fairly long and slightly curved. *Eyes :* Large. *Comb :* Single, medium size, straight and upright, free from side sprigs, evenly serrated with five or six spikes (five preferred), of fine texture. *Face :* Smooth, and of fine texture. *Ear-lobes :* Well developed, pendant, and of fine texture. *Wattles :* Rather large and of fine texture.

Neck.—Of medium length, and with full hackle.

Body.—*Back :* Broad, of medium length, flat at the shoulders, and the saddle rising abruptly to the tail, the saddle being abundantly furnished with hackles. *Breast :* Deep and well rounded, with a long breast-bone, and the keel slightly rounded. *Wings :* High or low, the latter more usually.

Tail.—Fan-shaped, carried rather high, with plenty of side hangers, and the two sickle feathers some six inches or more beyond the rest.

Legs and Feet.—*Legs :* Thighs rather short and covered with soft feathers ; shanks of medium length, small boned, standing well apart, and feathered down the outer sides (not too heavily nor scantily). *Toes :* Four, long, straight, and slender, the outer toes being feathered.

Carriage.—Graceful and extremely active.

Weight.—9 lb.

HEN

With the exception that the *Fluff* should be rather more abundant, the general characteristics are similar to those of the cock, allowing for the natural sexual differences.

Weight.—7 lb.

COLOUR

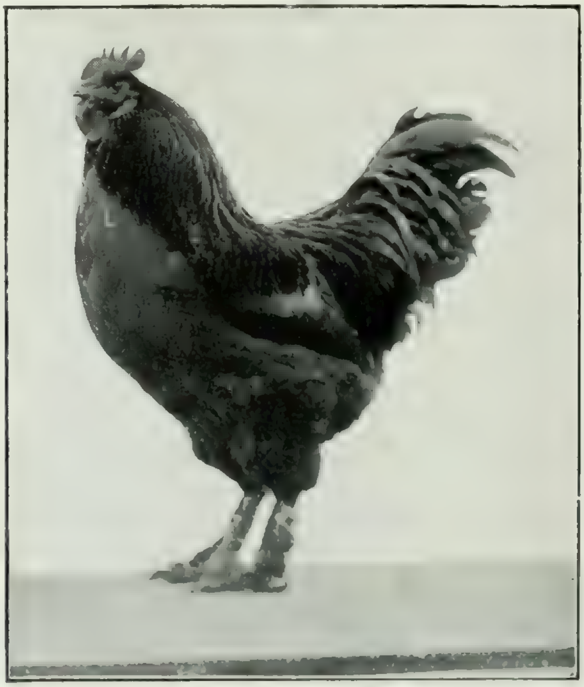
Beak : Light to dark horn. *Eyes :* Brown to very dark hazel, the darker the better. *Comb, Face, Wattles, and Ear-lobes :* Brilliant red. *Legs and Feet :* Blue-black, showing pink between the scales, the web and bottom of the feet pink-white (the deeper the pink the better), and toe-nails white.

Plumage.—Dense black, with a brilliant beetle-green gloss and free from purple or blue tinge.

SCALE OF POINTS

Size	15
Symmetry	15
Richness of colour	15
Condition	11
Head and comb	11
Legs and feet	11
Thin skin and white flesh	11
Fine bone	11
	100

Serious defects : Yellow legs ; yellow at base of beak or around eyes ; five toes ; permanent white in ear-lobes ; slate or blue legs in young birds ; white feathers in adults ; coloured feathers ; decided blue or purple sheen or barring ; white tips to feathers ; brown or black patches on toe-nails ; white in shank and toe feathers ; wry tail ; lop comb ; side sprigs.



A Croad Langshan Cockerel.

From a photograph kindly supplied by Mr. [illegible]

CHAPTER XVIII.

ORPINGTONS.

WITH the fowls known by this name we enter upon a large class of modern breeds, produced by crossing from one or more of the original Asiatic races, including in every case some proportion of the Shanghae element. Most of them originated in America; but all those treated of in this chapter were produced in England, and some had quite different origins.

Writing in 1911, Mr. W. Richardson, of Horsham, Sussex, founder of the Buff Orpington Club, and President of both the Black and the White Orpington Clubs, to whom we are indebted for notes on the Black, Buff and White varieties, says:—

"There is no breed of modern production in which so much interest is taken or over which there has been so much controversy as the Orpington. A good many fanciers of the older breeds raised at first all sorts of objections to them, but the opposition to their introduction only seemed to make their admirers more keen to develop the breed, with the result that there are now probably more fanciers and breeders of Orpington fowls than of any other breed of poultry.

"There are seven varieties of Orpingtons, and I will name them in their order of introduction to the public: Black, Buff, White, Jubilee, Spangled, Cuckoo and Blue. There are also rose-comb specimens of the Black, Buff and White varieties. The first two are hardly ever seen now, but there are a few fanciers who breed the rose-comb White Orpington, which seems to be largely developed from the White Wyandotte, as the original single comb White Orpingtons never produced any rose-comb specimens."

Black Orpingtons.

The one to be first described, and the original Orpington, is so largely a Langshan that we should have included it in the previous chapter if it had stood alone. It was originated and pushed by the late Mr. W. Cook, then living at Orpington, in Kent, from which Kentish town he took the name. He stated that the method of production employed in regard to the single-combed Orpington was to cross a large Minorca cock with black sports from Plymouth Rocks; pullets of this cross being then mated with clean-legged Langshan cockerels, and the produce carefully bred to a deep-bodied and short-legged type. The result was a black fowl with the green gloss of the Langshan, but with clean legs, of the plumper make of the illustration on p. 280, with white skin and meat and a well-shaped carcass, and which is an excellent winter layer of brown eggs. The weakest point of the Orpington is that the eggs are not so large as might be expected from the size of the fowl; still they are, in single-combed strains, of a fair average size. Mr. Cook also produced a rose-combed Orpington from the rose-combed Langshans mentioned in the preceding chapter, which had the same general qualities, but with the curious difference, which we are unable to explain unless from some individuality of the rose-combed Langshans employed, that the eggs are smaller than from the single-combed. Owing probably to this difference, the rose-combed Black Orpington has never become generally popular.

There is no doubt that some original Black Orpingtons were produced as stated; but there is as little doubt that the breed has since considerably changed in two distinct directions. As stated in our next chapter, there is little question that one of the components of the Plymouth Rock was the Black Java fowl; and, as stated in the preceding, it is equally obvious that this Black Java has much in common with the Langshan, however that fact be interpreted. This darker and more typical component in the Asiatic blood had thus a double prepotency, and its predominance over the more Shanghae components would be intensified by breeding for clean instead of feathered shanks. This doubly strong element therefore rapidly overpowered the Minorca element, and the Orpingtons quickly became to all intents and purposes clean-legged Langshans, taking the place of that shorter-legged, symmetrical type once popular, but subsequently discarded by the personal feeling of Langshan breeders. In addition to this tendency, in the early days of the breed it is known that clean-legged pure Langshans, from perfectly orthodox sources, were sold to Orpington exhibitors, and appeared immediately in exhibition pens, as well as being used for breeding with their stock. This still further strengthened and hastened the reversion to Langshan type, which was then so pronounced that at many shows only one class for "Langshan or Orpington" (or the converse) was provided for the two breeds. The index of this change has lain chiefly in the size of the eggs, which has somewhat lessened since the Minorca element lost power; and in the colour of the eyes, which was often red while any foreign element remained, but has now almost everywhere reverted to the Langshan brown or black.

There has been, however, quite another change, a black Orpington of practically new blood coming upon the scene in 1891, when the late Mr. Joseph Partington exhibited at the Dairy Show in October two cockerels and two pullets, which secured first and second prizes in each class, three of the four birds being immediately sold at £30 each; notwithstanding which, at the Palace Show a few weeks later he brought out fresh birds of each sex that beat these previous winners. These birds were of a size that had never before been seen, creating quite a sensation and considerable curiosity. Mr. Partington assures us that these Orpingtons also were cross-made birds, but had none whatever of Mr. Cook's original strain in them at all, and that he had deliberately started with the idea of breeding himself something in the same line, but more striking and handsome. They were very large, and of splendid colour, with massive shape, and all had dark eyes. These points made them invincible in the show pen, and from this new strain, combined with the original, are descended the bulk of the winners of the present day. Many of the new strain displayed so much more fluff than former Black Orpingtons, that we cannot help thinking large females of either Black, White, or perhaps even Buff Cochin may have been employed with Langshan males.

Writing on the Black Orpington, Mr. W. Richardson says:—"The first variety of the Orpington fowl to appear was the Black single comb and rose-comb. The birds were identical but for their combs, and the single comb variety was always much more popular.

"The Black Orpington is our handsomest black fowl, and to see the classes at the classical shows is a treat to a lover of black poultry. They are, as a rule, good layers of a nice brown egg, and, except for their black legs, a first-class table bird.

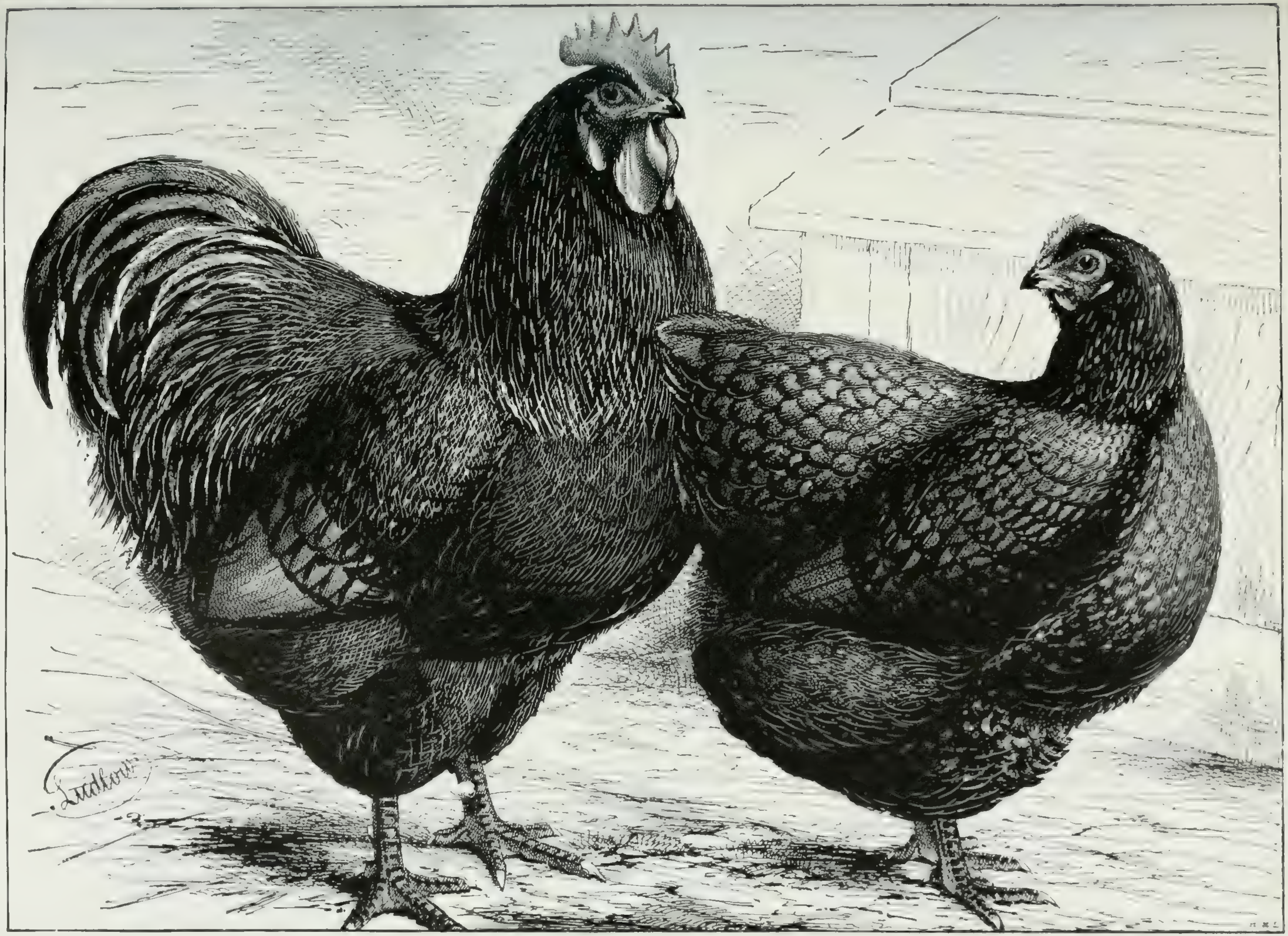
"The colour of the cock should be black, with a rich beetle-green sheen on all his feathers, free from bronze purple, purple barring or red or white in neck or saddle hackles. He should be massive, short, broad and deep in body, showing a wide U-shaped curve on the back and underneath, and stand on short, straight legs, black in young birds and dark slate colour in old ones. There should be no red or yellow in feet or legs, and his toes should be well spread out and straight with white toe-nails. The comb, wattles, and ear-lobes should be medium in size and of a fine deep coral red, the comb should be straight, evenly serrated, and set firmly on his head. His eye should be dark brown or almost black, the darker the better, and his beak should also be black or very dark horn colour. His plumage should be silky in texture and very abundant, and his tail and hackles should be flowing, but his tail should not be long nor the feathers too stiff.

"The hen's colour should be the same as that of the cock. She should look as massive as possible, her tail should be short, and she should have a nice wide rising cushion like the Brahma, rising gradually to the true tail feathers, as distinguished from the round ball cushion of the Cochin, which is very objectionable. The curve of her body should come straight down from her head round the breast and passing under and up to her tail in a perfect wide U shape, the same as the curve on her back from head to tail.

"Some birds show a keel which is not required, and it rather spoils their outline and appearance. The weight of the cocks should be from 9 lb. to 11 lb., and that of the hens 7 lb. to 10 lb. Equally good cockerels and pullets can be bred from the same pen, which saves double mating, though some strains seem to produce better cockerels and others better pullets."

Breeding Black Orpingtons.

Colour should be bred for as in the Langshan, but the crimson between the toes is not required. Particular attention should be given to preserving the correct shape, with a broad and deep breast, the whole body looking massive and solid, and set rather low. Excessive fluff should be avoided, as tending to decrease laying, and being often accompanied by thicker skin; too small combs, also, are apt to be signs of diminished egg-production. We have seen one or two



BLACK ORPINGTONS.

specimens distinctly *keeled*, almost like some exhibition ducks, and this ought certainly to be deprecated.* It is probably due to carelessness of these points that statements have lately appeared to the effect that some strains of the Black Orpington have not kept up its reputation as a good layer. Both abundance and size of eggs would, however, quickly respond to selection for these qualities, in the manner insisted upon in former chapters of this work.

Buff Orpingtons.

The first pair of Buff Orpingtons ever shown as such were exhibited by the late Mr. W. Cook at the Dairy Show of October, 1894, when Mr. Cook drew our special attention to them, and made the same statement which has been made on many other occasions, that they were produced by mating a Golden-spangled Hamburgh with a coloured Dorking hen, pullets from the produce being mated with a Buff Cochin cock, the main characteristic of the birds being the combination of buff plumage, with *white* legs and feet. We remarked, on this earliest possible occasion, that a fowl with such points might probably prove both valuable and popular; but that there was grave objection to calling them Orpingtons, since he had already appropriated that name to another fowl, which had, according to his own account, not one single element in common. Such nomenclature would not have been allowed by the Poultry Association of America, and objection to it was widely expressed by the most prominent authorities in England, with scarcely an exception; the already existing Orpington Club also protested against the same name being given to another fowl which had not in it one atom of the same constituents as theirs. A considerable amount of discussion took place later, emphasised by the fact that precisely similar fowls were exhibited under another name at the Smithfield Club Show of dead poultry. Owing largely to this latter circumstance, the question was finally brought before the Poultry Club, who decided that it was then too late to interfere; but intimated that such a case would not again be allowed to pass unnoticed, and in this way it is to be hoped that the circumstances may have produced a more definite understanding concerning such matters in the poultry world.

Buff Orpingtons and Lincolnshire Buffs.

The actual origin of the breed must be questioned, as well as its present name. There is no reason to doubt that Mr. Cook really did breed birds as stated, and that these have been sold as Buff Orpingtons, or that to his persistent advertising and pushing it the popularity of the fowl was mainly due; the latter fact proving that capital may be employed as successfully in floating a variety of poultry as in founding a new journal. But evidence was published simply overwhelming in amount, to the effect that the stock about the country is mainly derived from breeding up to points a gradually formed and popular local amalgam of Buff Cochin and Dorking, which has long been known in Kent, Surrey, and Sussex, and still more so in Lincolnshire; whence it has been called, in market parlance, the "Lincolnshire Buff," forming a large portion of the "Boston" fowls sent to the London market.

To sum up a controversy given at some length in a previous edition, there is no reason to doubt that Mr. Cook bred birds as alleged, and it is well known that some of the early Buff Orpingtons sent out bred very much as might be expected from such heterogeneous crossing. There is an abundance of evidence that all breeders who took up the new breed found plenty of work to do in it, and that some of them selected simply the best specimens they could find, wherever they could find them, in Surrey, or Lincolnshire, or anywhere. That birds were bought in the latter county of people who had bred nothing else for a quarter of a century and were shown directly as Buff Orpingtons, and used by Buff Orpington breeders, is quite certain; and various successful strains have no doubt had different local origins, which accounts for the fact stated by Mr. Richardson presently, of the evil results found to follow from crossing these different strains. It is noteworthy that none of the early show specimens had the shape of the Black Orpington, all being higher on the leg, longer in the back, and less massive in the body; but breeders have, as we write in 1911, by paying attention to make and shape, overcome these defects.

The merits and utility of the breed stand apart from its origin and name. Those who objected to the latter were accused of making a "virulent attack upon the breed," but without, as far as we know, any foundation. The fowl itself was recognised by nearly all as a most valuable one, endorsed already by the long experience of the Lincolnshire breeders as a first-class breed for the market; and speedily found, as soon as kept alive for other purposes than market, to be a most hardy bird and prolific layer. Putting aside some of the claims advanced to which there are reasons for taking exception, the late Mr. Cook may be given full credit for "booming" and making known in other than poultry-fattening circles, what is recognised as one of the most attractive and useful of all classes of poultry, combining the beautiful and popular buff colour, with admirable table and laying qualities. It is probable that the Buff Orpington, as now known, comes as near to the ideal of an all-round, general purpose fowl as is humanly possible; and it is not a small service to have made such a bird popular amongst breeders generally.

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* The only other breed in which we have personally seen such a peculiarity is the Faverolles.

Breeding Buff Orpingtons.

In breeding Buff Orpingtons the main points to keep in view are (1) colour of plumage, as in all buffs; (2) clean white legs; (3) make and shape. The following notes are kindly supplied by Mr. W. Richardson, founder of the Buff Orpington Club, and well known as a successful exhibitor.

"Following close on the Black Orpingtons the late Mr. W. Cook introduced the Buff Orpington, showing a pair at the Dairy Show in 1894, and the buffs soon jumped into the ranks of first favourites with many fanciers. I took up poultry in 1895, and the first pure bred fowls I had were Buff Orpingtons, and I have always placed them first favourites and bred 500 or more every year since. There was a great deal of controversy with regard to their introduction, and no doubt any kind of buff fowl that looked at all like a Buff Orpington was sold as such. Taking a deep interest in the breed, I set out to find what was their real origin and if they were, as many asserted, only Lincolnshire buffs. I visited about the years 1897, 1898, and 1899 all the breeders I could hear of, and also several breeders of Lincolnshire buffs, and I satisfied myself completely that they were two different breeds. In the first place all the Lincolnshire buffs bred on the farms in Lincolnshire that I visited, where they professed to breed them and nothing else, were identical with the original Buff Cochins as shown in this book, and I have no hesitation in saying that the present-day Lincolnshire buff is nothing else but the descendant of the old Buff Cochin.

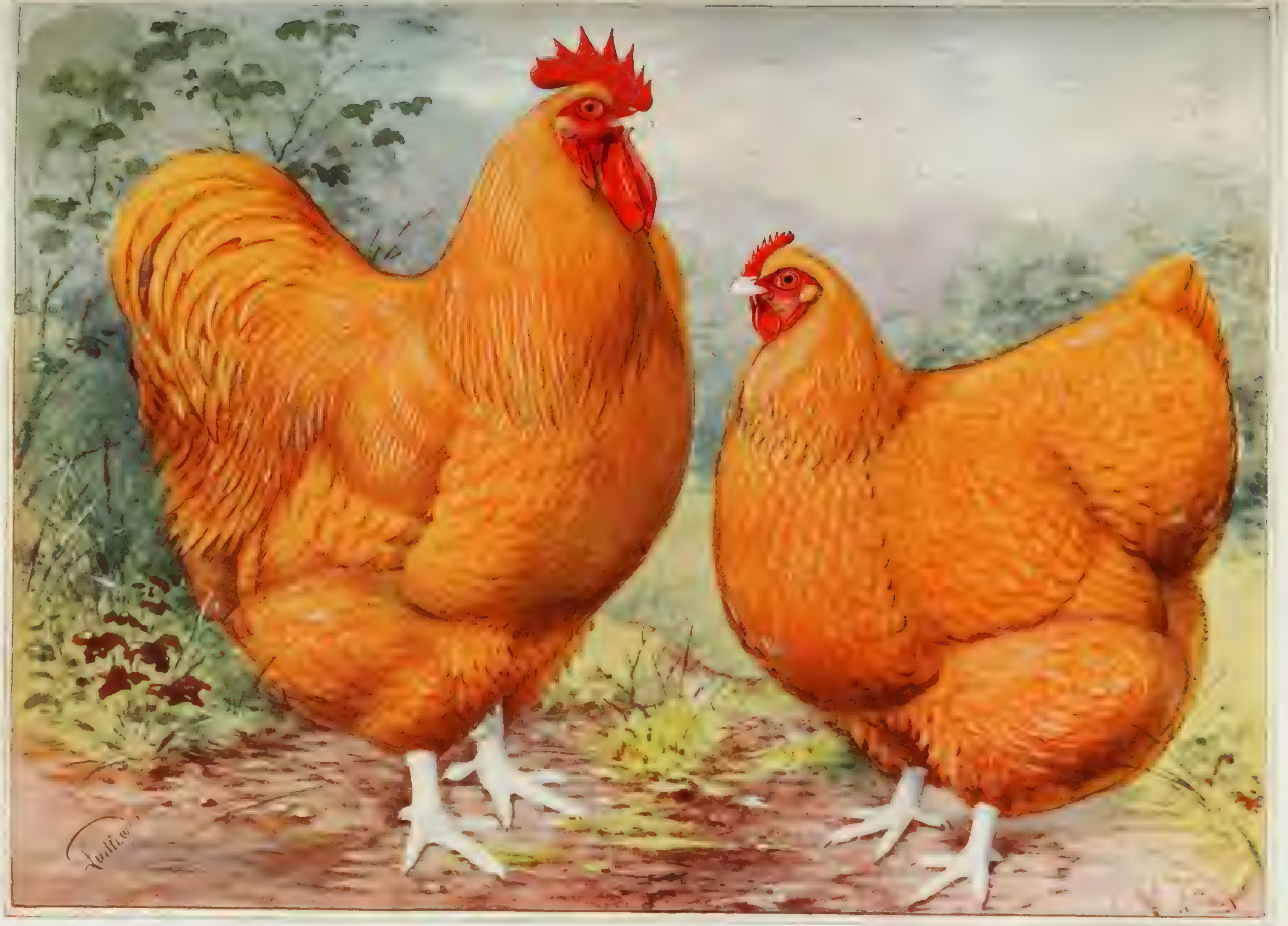
"I met a large farmer in Lincolnshire who had bred buff fowls for many years and liked the clean white-legged buff birds, and he told me how they had been evolved. In the old days the people kept Dorkings, and when the Buff Cochins came along they were crossed with the Dorkings, but finding the cross not very good layers, they again crossed them with Golden Hamburgh cocks, the result being a clean white legged buff fowl of very good all round qualities. By selecting the best specimens to breed from every year the birds bred more and more to the type required.

"This farmer also told me that the late Mr. W. Cook had bought all the birds he would sell two or three years before I was at his place, and he also told him how the birds had been bred, so there was no doubt in my mind that these birds formed some part at least of the foundation of the Buff Orpington fowl.

"Many breeders have tried to improve the Buff Orpington by introducing crosses of the Buff Cochin and Buff Plymouth Rock, and, as far as I have seen, without much success, as where one point might be gained two would be lost. I have never introduced any cross into my birds, though I have tried the same experiments as others, because I found there was no advantage, and, on the other hand, a lot of trouble. I also prefer to keep the breed pure and develop it from itself, and this in the long run has given me much more satisfaction. The Buff Orpington is a most useful and handsome bird, and in my opinion it and the White Orpington are the two most useful fowls we have. The real Buff Orpington is an everlasting layer, a first-class table bird, and a grand exhibition fowl. It is hardy and strong, and as I have always bred mine on the cold wet Sussex clay, on which some kinds of poultry will not do, they must be strong to stand it. If anything, I find the chickens stronger every year; out of 400 chickens I hatched in 1911, with the exception of a few that never started, I lost but two.

"The Buff Orpington cock should be of as nearly as possible the same type as the black, but owing to not having as much length of feather they look somewhat taller and not so massive, yet there is not much difference in their body measurements. In colour the buff should be of an even dense orange, neither red, yellow nor brassy, and the colour should be bright and as near one shade all over as possible. The best specimens are very nearly perfect in colour, but most of them show a little dark in flights and tail, and a few of them some white, and I think it will be some years before they all come perfectly buff in a flock, even if they are bred from the best picked specimens.

"Strain has a great deal to do with the breeding of Buff Orpingtons. I have proved



BUFF ORPINGTONS

over and over again that even if the best cockerel of one strain is mated with the best pullets of another the result is very disappointing, as they invariably throw back.

"Each feather on the bird should be the same even shade and be buff to the skin. There should be no mealiness, and the shaft of the feather should not be lighter in colour. There should be no light lacing or fringing in the feathers, and the wider the feathers are the better. A good many cockerels show an unevenness in the feathers on their backs which is known as rustiness and is very objectionable, and those birds generally breed pullets with dark lacing on their backs.

"If the feathers of a hen are closely examined, especially on the hackle and back, it will be seen that the very edge is hard and shiny, resembling the ends of the hackle feathers of the cocks, and I find that the edge of the feather does not fade in the same way as the rest of it, therefore the feathers of a partly faded bird look laced. The comb, wattles and ear-lobe should be bright red, the comb medium, evenly serrated and straight, and the eye should be red.

"Exhibition hens and pullets should be as massive as possible and short on the leg, but not stumpy, and their colour should be an even golden orange, free from any meal, which is about the worst fault in the hen's plumage. They should be the same shade on the breast as they are on the back, and should not appear to have lacing on the feathers, either dark or light. They should have neat heads and small combs, evenly serrated and straight, free from side spikes, and the eye should be red. They should show plenty of bone in their feet and legs, and the toes should be well spread out and straight in shape. They should resemble the Black Orpington as much as possible and be free from the objectionable ball cushion of the Cochin, and the legs should not be blue, as this is a bad fault."

Writing in our last edition, Mr. Percy Thorniley said:—

"In selecting birds for stock, I proceed as follows: first examine all birds for colour; then for type; and lastly for size, especially in the female. My experience is that you cannot breed big chickens from small hens, no matter how big the cock is. Of course, the minor points must be taken into consideration, too, according to their degree of imperfection, for if you once get one of these minor points established in your strain you will find it most difficult to get rid of; such, for instance, as a badly-formed comb, or a white ear-lobe.

"For exhibition purposes the buff is a most difficult colour to keep sound, and to ensure this it is most essential that the birds have complete shade and protection from the sun and rain, such as a run in a wood or shrubbery. Where this is not possible other means must be devised. The suggestion has been made to me of planting artichokes in the runs a short distance apart. But however much shade you give your birds through the summer and during the moult, they will be much lighter in colour the second year than the first. The tendency is, from the time they are hatched until they assume their adult plumage, to go darker and more even; after that they go to lighter again. This is why it is such a difficult matter to advise which chickens it will pay to keep, and which to put in the pot. The chickens are very hardy and easily reared."

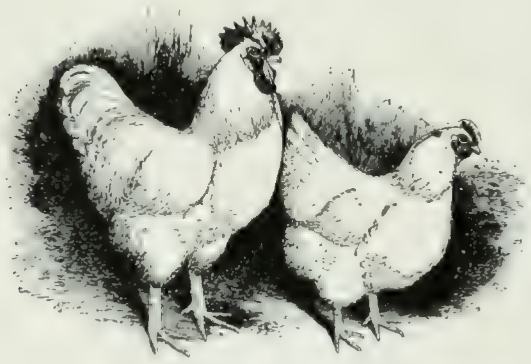
Reference may also be made to what was laid down respecting the breeding of buff poultry generally, on page 245; and Mr. Cromack, in a lecture to which we acknowledge indebtedness, related experience which is a very practical commentary upon the advice there and above given. Out of the first seven pullets with which he was successful (and which he had picked up in Surrey, after failing with the first stock he secured), there were different shades of plumage, two only being buff to the skin, while the others were white under-colour, though buff on the surface. By the advice of a friend he mated up the white under-colour, and not one of the produce was worth exhibition. Next season he bred from the all-buff birds; and out of one brood eight realised nearly £30. The white legs and skin require all the greater care in selecting sound buff plumage.

In Sussex, and Surrey, and doubtless other localities, the white shanks are more easily preserved than in others, owing probably to effects of soil. But the greatest difficulty in keeping up this point arises from the different origin of various strains, as already alluded to. It is still attempted in some quarters to attribute the occurrence of yellow shanks to "crossing with the Lincolnshire Buff," and there are no doubt plenty of these birds, of the rougher type, which would have such an effect, while there are strains of Buff Orpingtons which rarely breed a yellow-legged chicken. But there are also strains of Lincolnshire blood which for generations have done the same; and the result of our own inquiries into this matter has been a conviction that the chief cause of the difficulty now is the introduction of either Buff Plymouth Rock, or of stock into which that blood has been introduced.

For the following notes we are also indebted to Mr. W. Richardson:—

White Orpingtons.

"I showed my first White Orpingtons as Albions at the Dairy Show, I think, in 1900, and the only White Orpingtons that were known before that time were some rose-comb birds which were evidently a cross of White Dorkings and White Leghorns, showing little of the true Orpington characteristics. The birds I showed were pure sports from Buff Orpingtons, and, of course, were similar in type except for their white colour, and I procured these four white sports as chickens from the same farm in Lincolnshire whereon I saw the Buff Orpingtons. I had myself bred a white chicken (a pullet) from my buffs the year before, but sold it, as single-comb White Orpingtons had not then been heard of. I agreed to change the name from 'Albion' to 'Orpington,' as several fanciers who had taken them up thought they would go better as such, especially as they were sports from buffs.



Albions.

As exhibited at the Dairy Show in 1900.

"The birds I had at first were rather small, but of good type for those days, and perfectly white, and my stock to-day are directly descended from them without any other cross. I once crossed a White Plymouth Rock cock with two or three pullets, but the result was so disappointing that I killed all the chickens to make sure that they did not get mixed with my original whites.

"The White Orpington has one or two faults in breeding, but these are not very troublesome to overcome. One is that they throw a few yellow-legged chickens, a defect not due to a cross, as the original Buff Orpington that they sported from did the same. Another defect is that some White Orpingtons come with a creamy or sappy colour in their feathers, but I find a very small proportion now in the total of the chickens. Birds are also shown, especially hens and pullets, with blue legs, which is very objectionable, and I think due to some out cross. I have also seen a few specimens with green or willow legs. There is little doubt that when the single-comb White Orpington was first brought out that it became so popular that it was impossible to breed enough birds to supply the orders, and many people tried to produce them from various crosses. These attempts at short cuts, of course, led to many faults in the birds thus bred that my original birds never had. Others may have had odd sports from their buffs, and I have heard that there were white sports from the Black Orpington some years before the White Orpington was before the public, but I never saw any.

"One thing is important, and that is to be able to distinguish between a sappy bird and one that has been turned a bit yellow on the top by the sun or weather. Exposure of this kind only affects the hard part of the feather in the hackles of the cocks and on their wing bows and saddles and the hackles of the hens. Sap, however, shows all through the feathers to the skin. Some birds, indeed, look as if they had been dusted with yellow sulphur. It should also be remembered that white birds are easily stained by being bedded down with oak sawdust or straw, as when either these or the birds get damp their plumage becomes discoloured, and this is very annoying as it is impossible to get it out.

"The White Orpington cock should be a large massive bird of the same type as the Buff and Black, and should have clean ivory white legs with as little pink showing in them as possible. His colour should be snow white, and the feathers should be dense and of a nice silky texture. His comb wattles and ear-lobes should be bright red and medium size. The comb should be evenly serrated, straight, and free from side spikes; his eye should be red, and he should be free from sap in the feathers or a pink shade on the wing bow. Whites throw a few feathers with a little black or buff in them, but as a rule very slightly, and it is not of much consequence.

"The hen should be the same as the Black and Buff Orpingtons, massive and cobby, standing on good, stout, white legs, the head should be neat and the eye red, the worst faults to be noticed being blue in leg and white in lobe.

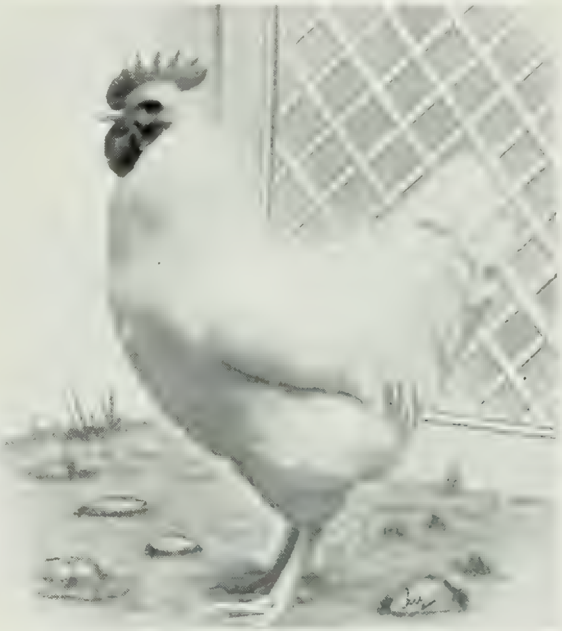
"The White Orpington is a marvellous layer of a nice large brown egg, surpassing, I think, the Buff in that respect, though some buffs run them very close. I have known a pen of my whites to average 206 eggs in the year. In conclusion, may I add that it has given me much pleasure to write these notes on three of the finest breeds of poultry in existence, and I hope they may be of some assistance to those fanciers who wish to breed them."

We have thought it of interest to reproduce an illustration from *The Feathered World* of October 26th, 1900, of Albions exhibited at the Dairy Show of that year, and for comparison therewith a photograph of the winning White Orpington cockerel at the same event in 1910. There is no doubt that, consequent upon the success of the Black and Buff Orpington, other breeders were working concurrently with Mr. Godfrey Shaw and Mr. Richardson upon the production of a white fowl of Orpington type. It may be of service historically therefore to quote here an extract from "The Orpington and Its Varieties" (*Feathered World*) from the pen of Mr. Wm. H. Cook:—

"The origin of the White Orpington is somewhat remarkable, as, in the first place, the originator, the late Mr. W. Cook, in breeding the Buff Orpington, was surprised to find many chickens coming pure white, and as these sports grew, their colour remained absolutely snow white; they appeared to be thicker set or more cobby specimens than the then existing Buffs, and by experimenting in mating these sports (which, by the way, were all pullets) to White Cochin, White Dorking, and White Game male birds, the White Orpington was produced, and is to-day perhaps the most popular variety of the Orpingtons. It might be advisable to here add that occasionally a single specimen will revert to one of the above-named male birds used in their production, therefore one may see a little feather on the leg from the Cochin, a fifth toe from the Dorking, or a tinge of yellow in the legs, feet, and beak. These defects are now rarely seen on stock bred from the best and most reliable strains."

Orpingtons in America.

It is, comparatively, only recently that the Orpington has been kept to any extent in America, and even now the Black, White, and Buff varieties are alone recognised by the American Poultry Association. In the American Standard of Perfection (1905) only single-comb Buff Orpingtons were recognised, the reference to them being as follows: "These are our latest importation from England. They are large and stately in appearance, with long, round, deep bodies and very full breast and back development. The abundance of back and saddle feathers on the Orpington male gives him the appearance of having a short back. In colour a harmonious blending of rich golden buff in all sections is most desirable. The same shade of colour should prevail throughout the specimen." Since 1905 the White has usurped the Buff's position as regards popularity, while the Black takes third place, the latter variety being now bred less feathery and slightly longer in the back than the English type. The standard weights required in both Buff and White Orpingtons in America are 10 lb. for cocks, 8½ lb. for cockerels, 8 lb. for hens, and 7 lb. for pullets.

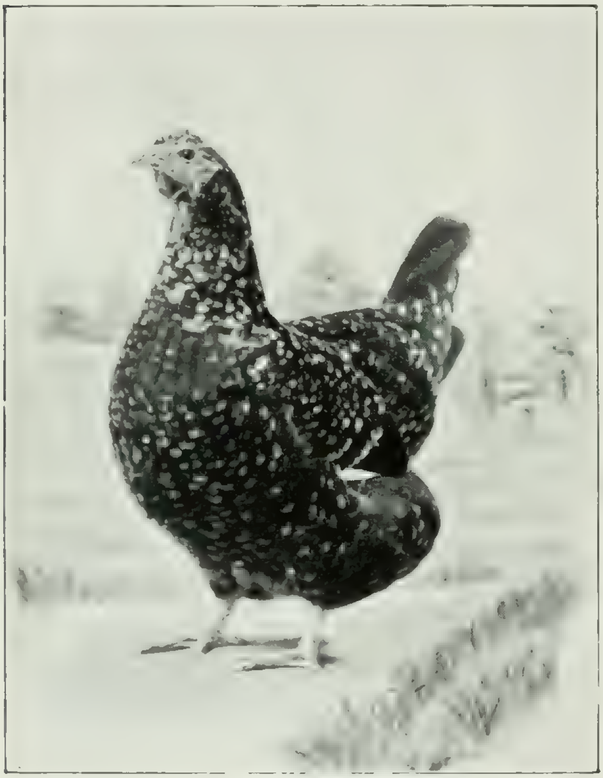

White Orpington Cockerel.

Our chapter on the Orpington would not be complete without notes upon the latest additions to the family, even though, as in the case of the Buffs, exception may be taken by some as to their strict right to the family name, and in at least that of the Jubilee variety of marked similarity to the Speckled Sussex, an old and useful breed. However, the Variety Orpingtons have come and won much popularity, and Mr. Wm. H. Cook, of St. Paul's

Cray, son of the late Mr. W. Cook who originated the Orpington, and who therefore is quite *au fait* with the methods of their production, very kindly contributes the following notes on the varieties in their order of introduction, viz., Jubilee, Spangled, Cuckoo, and Blue:—

Jubilee Orpingtons.

"This handsome variety was introduced early in 1897, and derived its name from the Diamond Jubilee year of our late Queen Victoria. The birds are particularly handsome, with their chocolate ground colour, a black bar and white spangle at the end of each feather, and to-day are exhibited showing even markings of the three colours. They are cobby in build, are deep and broad, with short, white legs and four toes, all quite free from any stubs or feathers. The comb should be of medium size, firmly set upon their head, and free from any side sprigs; and the birds should have red ear-lobes and small, rounded wattles.


Jubilee Orpington Hen.

"During the last two or three years Jubilees have increased in size, and there is not now (1911) so marked a difference between them and the Black, White and Buff varieties. For table birds the Jubilees certainly equal any other fowl; they are quick growers and very prolific winter layers; and the cockerels are in great demand amongst farmers for turning down with their cross-bred hens, and excellent results have been obtained by such mating.

"Among fanciers the Jubilee is very popular, as double mating—*i.e.*, one pen for producing the best cockerels and another for breeding the best pullets—is not necessary, and a single pen will produce first-class specimens of either sex. The leading poultry shows provide classes for Jubilees, and whereever exhibited they attract attention by their pretty appearance and uniform shape; and they are suitable alike to a working-man, with quite a limited space, or a poultry farmer having acres at his disposal. They have, moreover, the advantage of having their interests looked after by the Jubilee Orpington Club and the Variety Orpington Club.

"As to how Jubilee Orpingtons were produced is not generally known among many of the oldest breeders to-day, but I may state at the start that Buff Orpington pullets were selected of a chocolate or reddish-brown colour, and these were mated to the old Red Dorking, the cocks showing the most black in them being used. Many good coloured specimens were thus obtained by the first mating, and by continuous and careful selection of the progeny, the fifth toe and long back of the Dorking was stamped out. Golden Spangled Hamburgh cocks were also used on to many of the above first-cross pullets, and here again the difficulty of the white lobe and rose comb had to be bred out.

"Present day breeders can still easily trace three bad faults sometimes arising in their stock—viz., the large comb of the Dorking, which often becomes floppy, side spikes on this particular kind of comb, and white in lobe, the two latter faults coming from the mating of the Hamburgh cock on to the single-comb Dorking-Buff pullets.

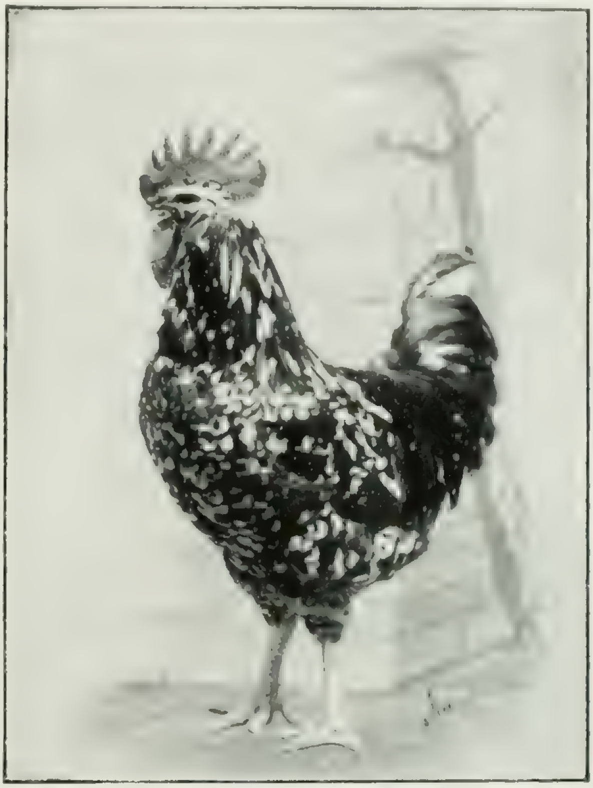
"The ground or main colour in both sexes should be a nice reddish-brown, then a black bar (which is usually a beetle green), the end of the feather being tipped or spangled with white. In the cocks the neck and saddle hackles are extremely pretty, being a bright mahogany colour, a black beetle-colour striping, and tipped with white. The average weight of the cocks is 10 lb., and the hens 8½ lb. A few defects that breeders must avoid, if they are intending to exhibit, are: White in ear-lobe; spikes on either side of the comb, or too large or weak a comb; black or dark neck hackles in either sex; ground colour too pale, or resembling a lemon or pale buff; other than four toes or white legs; or a black and white breast in the males, for the brown ground colour must predominate.

Spangled Orpingtons.

"The year 1900 saw the introduction of the 'Black and White' variety of the Orpington family, known as the 'Spangled Orpington.' The writer must here explain that the word 'spangled' has quite a different meaning to that of the word 'tipped.' The latter should be understood as meaning a small half-moon shape of some colour different from the main or ground colour of the feather. By 'spangled'—or, as often described, 'spangling'—is meant that almost half the feather is covered with some other colour than that of the ground colour. Owing to the plumage being striking and made up of but two colours, this variety has made good headway, particularly in the exhibition world, as, besides being a handsome fowl, it is a true Orpington in shape and build, and easy to breed true to markings. The Spangled is, if anything, a larger bird than the Jubilees, being somewhat longer in breast and body, and therefore making a very fine table fowl, with pure white flesh. As all-round layers they are prolific, and hold their own well with other varieties of Orpingtons. Excellent reports have been received from breeders in Canada who have imported eggs or birds, as to their hardiness and capability of withstanding any climate.

"In plumage they somewhat resemble the Ancona and Houdan, but are, of course, a much heavier and deeper bodied bird. The Spangled Orpingtons were in the first place simply sports cast off in producing the Jubilees. Many of these coming black and white were saved for at least one year to notice how they moulted out, and, in most instances, this proving satisfactory, they were equally divided, part being mated to very dark-coloured Dark Dorking cocks, the others were put with Black Orpington cocks. The progeny from these two matings were carefully selected and re-mated, thus producing the present day Spangled Orpingtons. Breeders of several years' standing can, after carefully considering the various breeds used for the Jubilees and later for the Spangles, trace the very few faults that occasionally disport themselves in their present Spangled Orpingtons. The ground colour should be a beetle-green black, each feather having a fairly large spangling of white from the tip to almost a third of the way up the feather; the comb is a single one, of medium size, firm, and well set upon the head; ear-lobe red; legs short, stout, and well set apart; four toes on each foot, and leg colour in accordance with the latest standard is mottled black and white, though all white is allowed. Weight of cocks 10 lb., and in hens 9 lb.

"Breeders should avoid using birds for breeding purposes, having the following defects, viz., side spikes on comb, white in ear-lobe, black legs and feet, any straw, red or brown markings in the plumage."


Spangled Orpington Cockerel.

Cuckoo Orpingtons.

"In 1907 the poultry fancy were surprised to find yet another variety of Orpingtons placed before them, and many remarks were expressed that, as the originator of the five former varieties had passed away, they did not anticipate a further addition. The experience I had gained with my father in the production of the former Orpingtons had naturally been of value, and as nothing is more interesting than making and perfecting a new variety, I worked at and introduced the Cuckoo Orpington. Classes have already been provided at the classic shows for the Cuckoo, and they are in the hands of many well known and prominent exhibitors, but I confess that my aim was not so much to make them an exhibition bird, as one possessing high-class utility qualities, combining a big, deep body on low legs, with prolific winter laying; and these merits are in themselves sufficient to make the variety popular. In appearance the 'Cuckoos' are somewhat similar to the barred Rock, without the objectionable long, yellow leg, which has given place to a short, perfectly white leg. The flesh and skin are pure white, the back is short and very broad; in fact, the Cuckoo is the blocky type so prominent in all the Orpingtons. They are extremely hardy, and lay a very large, rich brown egg.

"Single mating only is required, so that even the purchase of a small pen is sufficient to build up a good foundation stock of a general, all-round useful and handsome fowl. The colour is a light, bluish-grey ground, having bars across the feathers of a darker blue-black, proportioned to the size of the feather and the same on all parts of the body. The beak, legs and feet are pure white; lobes red; comb small, firm and evenly serrated.

"Defects to be avoided are white in lobe, any yellow in legs and feet, long legs, stubs or feathers on leg, side spikes, and more than four toes."

Blue Orpingtons.

"Quite the newest of the Orpington family is the 'Blue,' which I introduced just as 1907 was drawing to a close; and I do not remember any variety that caused such a sensation. Fanciers recognised in it a breed that would make tremendous headway, and the demand far exceeded both supply and anticipations. 'Imitation is the sincerest form of flattery,' and though 'Blue' birds of a different shade and shape have been exhibited, the 'original' Blue stood its ground, and for colour and type has now set the standard to the whole world. A true Orpington in build, with wide chest, broad back, small head and tail, low, wide-set legs, they resemble the Black Orpington more than any other fowl. As a layer the Blue is second to none. It is extremely vigorous and hardy, thrives well in any climate, and in appearance and colour is both pleasing and striking.

In their production Blues have certainly proved the most difficult variety to produce that I have as yet experienced, for the Blue colour is extremely hard to fix. Nothing but pure Orpington blood was used in their production, and these consisted of the White, Cuckoo, Spangled and Black varieties, crossed and recrossed, and marked success, as admitted by the oldest and keenest breeders, has been achieved.

"The colour in cocks is of a dark blue top colour, with a somewhat lighter blue breast and fluff, laced with an outer edging of a darker blue shade. In hens the chief ground colour is of a medium blue, each feather laced with a darker blue on the outside edges. The eye, legs and feet are black, ear-lobe red, comb and wattles small. Weight in cocks 10 lb., hens 9 lb.

"Defects which should be carefully avoided are: Hazel or light-coloured eyes, white legs, white in lobe, pale blue body colour."

ORPINGTONS (SITTERS)

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Small and neat, and fairly full over the eyes. *Beak:* Strong and nicely curved. *Eyes:* Full and bright. *Comb:* (*a*) Single or (*b*) rose; (*a*) of medium size, erect, evenly serrated, and free from side sprigs; (*b*) small, straight and firm, full of fine work or small spikes, level on top (not hollow in centre), narrowing behind to a distinct peak lying well down to the head (not sticking up). *Face:* Smooth. *Ear-lobes:* Of medium size and length. *Wattles:* Of medium length, rather oblong, and nicely rounded at the bottom.

Neck.—Of medium length and abundantly covered with long hackle feathers, which should reach well on to the back.

Body.—Deep and broad; wide and slightly rising saddle with full hackle, which with the long neck-hackle give the back a short and somewhat concave appearance. *Breast:* Broad and well rounded (not flat), carried forward. *Wings:* Rather small, carried closely to the body, the ends almost hidden by the saddle hackle.

Tail.—Rather short, compact, flowing and inclined backwards, but by no means in "squirrel" fashion.

Legs and Feet.—*Legs:* Short and strong, the thighs almost hidden by the body feathering. *Toes:* Four on each foot, straight, and well spread.

Carriage.—Erect and graceful.

Weight.—10 lb.

Plumage.—Fairly close but not so hard as in the Game fowl nor so soft, loose, and fluffy as in the Cochin.

Handling.—Firm flesh.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences. It is worth noting that the *Cushion* should be small, sufficient to give the back a short and graceful appearance, but not full and round, or "ball" shaped as in the Cochin.

Weight.—8 lb.

COLOUR

THE BLACK

Beak : Black. *Eyes :* Black, with dark brown iris. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Black. *Toe-nails, Soles of Feet, and Skin :* White.

Plumage.—Black, with a green sheen.

THE BUFF

Beak : White or horn. *Eyes :* Red or brown, red preferred. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs, Feet, and Skin :* White.

Plumage.—Clear, sound, even buff throughout to skin.

THE CUCKOO

Beak : White. *Eyes :* Red. *Comb, Face, Wattles, and Ear-lobes : Red. Legs and Feet :* White, or white mottled with black, white preferred. *Toe-nails and Skin :* White.

Plumage.—Blue-grey (light shade) ground, each feather barred across with blue-black (dark shade), the markings in keeping with the size of the feather.

THE JUBILEE

Head points, Legs and Feet : As in the Buff.

Plumage of the Cock.—Ground colour mahogany, of a bright shade, and not dark nor maroon. *Hackles and Back :* Mahogany, with black centre stripe, mahogany shaft, and white tip. *Breast, Thighs, and Fluff :* Mahogany, with black spangle and white tip, the three colours clean and distinct and showing in equal proportions, avoiding a ticked effect on the one hand, and a blotchy effect on the other. *Wings :* Bow, similar to hackles ; bar, black ; secondaries, mahogany, black, and white ; primaries similar, but more white allowed. *Tail :* Sickles white, or black and white, or black, white and mahogany ; coverts, black, edged with mahogany and tipped with white.

Plumage of the Hen.—*Neck-hackle :* To match that of the cock. *Body, Thighs, and Fluff :* Mahogany, with black spangles and white tips, similar to the breast of the cock. *Wings :* As body, but with primaries to match those of the cock. *Tail :* As in the cock.

THE SPANGLED

Beak : Black, white, or slightly mottled. *Eyes :* Red or brown, red preferred. *Comb, Face, Wattles, and Ear-lobes :* Red. *Legs and Feet :* Black and white, mottled as evenly as possible. *Toe-nails and Skin :* White.

Plumage of the Cock.—*Hackles :* Black, with white tips. *Back :* Black, slightly ticked with white. *Breast, Thighs, and Fluff :* Black, with white spangles, the two colours showing in equal proportions, avoiding a ticked effect on the one hand, and a blotchy effect on the other. *Wings :* Bow, similar to back ; bar, black ; secondaries and primaries, black and white, but more white allowed in the primaries or flights. *Tail :* Black and white ; the sickles and the coverts black with white tips.

Plumage of the Hen.—*Neck, Wings* (flights only), *and Tail :* Similar to those parts of the cock. *Remainder of Plumage :* The same as the breast of the cock, the effect to be uniform throughout the bird. (NOTE.—In both sexes the black should have a bright gloss (beetle-green), and the white should be pure and bright, the two colours distinct and not running into each other.)

THE WHITE

Beak, Legs and Feet, and Skin : White. *Head points and Eyes :* Red.

Plumage.—Pure snow white.

SCALE OF POINTS

THE BLACK

Shape : body, 15 ; breast, 10 ; saddle, 5	30
Head : Comb, 7 ; skull, 5 ; face, 5 ; eyes, 5 ; beak, 3	25
Plumage and condition	10
Carriage	10
Size	10
Tail	5
Legs and feet	5
Skin	5
	100

THE BUFF AND THE WHITE

Colour*	25
Type*	25
Condition	15
Head	15
Legs and Feet	10
Size	10
	100

THE CUCKOO

Colour and marking	25
Shape	20
Size	20
Head	10
Legs and feet	10
Condition	10
Skin	5
	100

THE JUBILEE AND THE SPANGLED

Colour and marking	35
Size and shape	30
Condition	15
Head	10
Legs and Feet	10
	100

Serious defects : Feather on shanks or feet ; white in ear-lobes ; long legs ; side spikes on comb ; any deformity ; yellow skin or yellow in shanks, or feet of Blacks ; any yellow on shanks or feet of Cuckoos ; other than black and white coloured feathers in Spangled ; any yellow in Whites.

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* *In* 1910 *the Buff Orpington Club allotted* 20 *points to colour and* 30 *to type.*

CHAPTER XIX.

PLYMOUTH ROCKS

THIS breed is of American origin, and is still occasionally stated to have been first formed by Dr. Bennett in 1850, but is not in reality nearly so old, except so far as he did undoubtedly give that *name* to one of his many curious productions. In his American *Poultry Book* of 1851 he gives the following remarkable account of these old Plymouth Rocks: "I have given this name to a very extra breed of fowls which I produced by crossing a Cochin China cockerel with a hen that was herself a cross between the fawn-coloured Dorking, the great Malay, and the Wild Indian. Her weight is 6 lbs. 7 oz. The Plymouth Rock fowl, then, is in reality one-half Cochin China, one-fourth fawn-coloured Dorking, one-eighth great Malay, and one-eighth Wild Indian. Their plumage is rich and variegated, the cocks usually red and speckled, and the pullets darkish brown. They are very fine-fleshed, and early fit for the table. Their legs are very large, and usually blue or green, but occasionally yellow or white, generally having five toes upon each foot; some have the legs feathered, but this is not usual." Of course a "breed" such as this, with legs feathered or clean, four-toed or five-toed, and of all the colours in a pack of cards, was too "extra" for any such common world as this, and inevitably died out by sheer disintegration of materials even more heterogeneous than were alleged of other breeds recently mentioned, but which had at least strains in their blood predominant enough to save them.

Origin of Plymouth Rocks.

For years nothing more was heard about Plymouth Rocks; and in the *New York Poultry Bulletin*, the first American poultry periodical ever published, during its first two years such a fowl was never even named. Their first mention in that paper was about 1870; and in response to a direct inquiry of our own, we received the first direct information about them in a letter from Mr. W. Simpson dated August 12, 1871, in which he states that their plumage was "Dominique" (the American term for blue barred or "cuckoo" colour), that they had been produced by crossing the native Dominique or common cuckoo fowl with Asiatics, and up to that time did not breed very true, while their eggs were all colours and sizes. Everything points to a new production about that time, from quite recent crosses, and there is not the slightest doubt that the present Plymouth Rock, of totally different colour from Dr. Bennett's old creation, had its origin about this time and in this general way. The first ever seen in England were sent over by Mr. W. Simpson in 1872, and took honours at Birmingham that year in the class for Any Other Variety; since which time they have rapidly grown in numbers and popularity, all the original stock having come to us from across the Atlantic.

Further investigation in America has made it pretty clear that the modern Plymouth Rock had more than one origin, and that the claims of various breeders, such as Mr. Spaulding, Mr. Drake, Mr. Upham, Mr. Giles, and Mr. Pitman, to have produced ancestors of the present birds, were all more or less well founded. Mr. I. K. Felch, whose long memory makes him a good authority, has traced various crosses made by different breeders, including the following: (1) Spanish on White Cochin, top-crossed by Dominique; (2) Dominique on Buff Cochin hens; (3) White Birmingham (supposed to be an English fowl, but what, no one can tell) on Black Java, the produce coming as white, black, and Dominique, and the Dominiques alone being bred together; (4) the same produce top-crossed with Dominique; (5) Black Java and Dominique; (6) some of the above crossed with Brahma. This last cross distinguished the Drake strain; and it has been stated by some that the amalgamation or breeding together about 1869 of this Brahma-crossed strain, with that of another strain also containing Black Java blood, produced the final improvement and stamp which gave the new Plymouth Rock its growing popularity from 1870 onward.

This origin of the fowl will explain the chief difficulties in breeding barred Rocks. The colour itself is not a natural primary one, but the produce of white with either black or very dark colour. Such colours, mated together,

Difficulties in Breeding.

produce as the result, on a wide average of cases, more or less of blacks, whites, mottles or splashes with the plumage of Houdans and Anconas, blues or blue duns like that of blue Langshans and Andalusians, and that bluish barred plumage known as Dominique in America and cuckoo in England. When once produced, this last colour has however a strong tendency to permanence; and in the common native Dominique fowl of the West Indies and United States it had been preserved and bred so long as to be of a very fixed type indeed, though even in these fowls there was a constant tendency for the white or black feathers of the original components to appear, as well as the straw or red which always troubles breeders of white or black fowls. But in the barred Rocks, fresh blood of both white and black had been thrown in; and in the Black Java particularly, which all accounts agree in stating had been always used on the female side, a strain had been used which we have already seen is perhaps one of the most strong and prepotent now in existence. To this day that strong black blood is constantly cropping up in barred Rocks, black sports continually occurring to an extent not known in any other blue barred fowl. These are almost always on the female side, though black feathers will also often appear in the male, which is however more subject to white than to black in his plumage. These facts are explained by the origin of the fowl, which, when well understood, affords valuable indication to the breeder as to his choice in certain cases.

Characteristics of Plymouth Rocks.

The general characteristics of the Plymouth Rock are very much what might be expected from its origin. It is a large fowl, only slightly inferior in size to the large Asiatic breeds. The comb is single and straight, evenly serrated, much like a good Cochin comb, but preferred rather smaller, with wattles large in proportion; ear-lobes smaller, and red. The head and neck are carried upright, and not forward like the Cochin's. The body should be large and rather square, but with a deep and compact appearance, and the plumage close, with only very moderate fluff; wings moderate in length and carried close. The shanks should be moderate in length, not long nor yet too short, and set wide apart; they are clean, and bright yellow in colour. The cock's tail should be neat, and carried only moderately high, and well compacted; but we never could understand the original Standard, which said it was "smaller" than a Cochin's, as even in England, where the ideal differs widely from the American, we have never seen a bird without a tail much larger and higher than any Cochin breeder would recognise as at all proper in his variety. The tail of the hen, though small, is also considerably larger and more projecting than that of a Cochin.

Colour of Barred Rocks.

The plumage is not easy to describe with exactness, and we have known two observers, both accustomed to consider their words, describe the same bird, and the very same feather from the same bird, differently, and in each case rather differently from our own idea as to its real colour. It is not so in regard to the barring; that runs straight across the feather, much like that of a pencilled Hamburgh, but considerably coarser; also the bars are not sharply edged, but the dark bar shades into the light through a small space, though they should not do so too gradually, or so as to destroy the distinctly "barred" effect. From about 1890 the bars have been bred perceptibly narrower and more numerous than formerly, though not so much so in England as in America; there is pretty obviously a happy medium, unless some day a fashion should set in for breeding an out-and-out "blue-pencilled" fowl; and beyond a certain point narrowness is not desired in either country. There is also a proper proportion between the dark bars and the light spaces, not very different from equal spacing being desired.

The real difficulty, no doubt, is how to describe the colour. Looking at the whole bird, in England especially, there is distinctly a blue dun shade or appearance about it; but when we examine a single feather, it is difficult to see any blue colour in it at all. The English Standard gives the ground as blue-white, evenly barred with bands of black of a beetle-green sheen; while the American Standard gives the ground as "greyish white," barred with "defined bars that stop short of a positive black." Yet average English feathers are certainly darker and with more approach to blue-dun in the ground colour than American feathers, while on the other hand American *birds* appear a distinctly brighter blue in the whole effect, than English birds. The fact is that the colour of a single feather is greatly affected by that of any surface on which it is laid; and when American feathers are laid upon a white surface, many of them appear merely black and white, each colour being a little dull, the white not quite pure and the black very slightly greyish. The feathers in Fig. 98 are photographed thus on a white ground, and show that effect; on a darker ground they would appear differently. English feathers similarly treated would appear greyer in the ground, and the bars on many we have seen are quite black, with more or less green gloss. It is difficult to find any single feather from Rocks as now bred, which appears blue at all; and yet the whole mass of feathers when superposed gives that impression distinctly. If any breeder will examine single feathers laid upon papers or cards of different colours, these remarks will be understood, and such facts make a really definite standard of colour very difficult to frame.

Merits of Rocks.

It was as a very profitable and generally useful fowl all round, that the barred or original Plymouth Rock steadily achieved popularity in the United States, and later in England. The colour wears well and looks well, especially about a farm; the laying powers are above the average, and when cultivated reach a very high standard indeed; the meat, though not white or such as in England is considered first-rate in quality, is extremely good and juicy; and the bird makes a *rapid* growth which is only equalled by Dorking or Houdan crosses. The constitution is hardy, and the chickens easily reared. Until the White Wyandotte arose, no fowl was ever bred and kept so extensively as the Barred Rock was in the United States, and it probably holds the first place there still; and we have already seen that it forms the basis of a large portion of the best table fowls sent over from Ireland.

Breeding Barred Rocks.

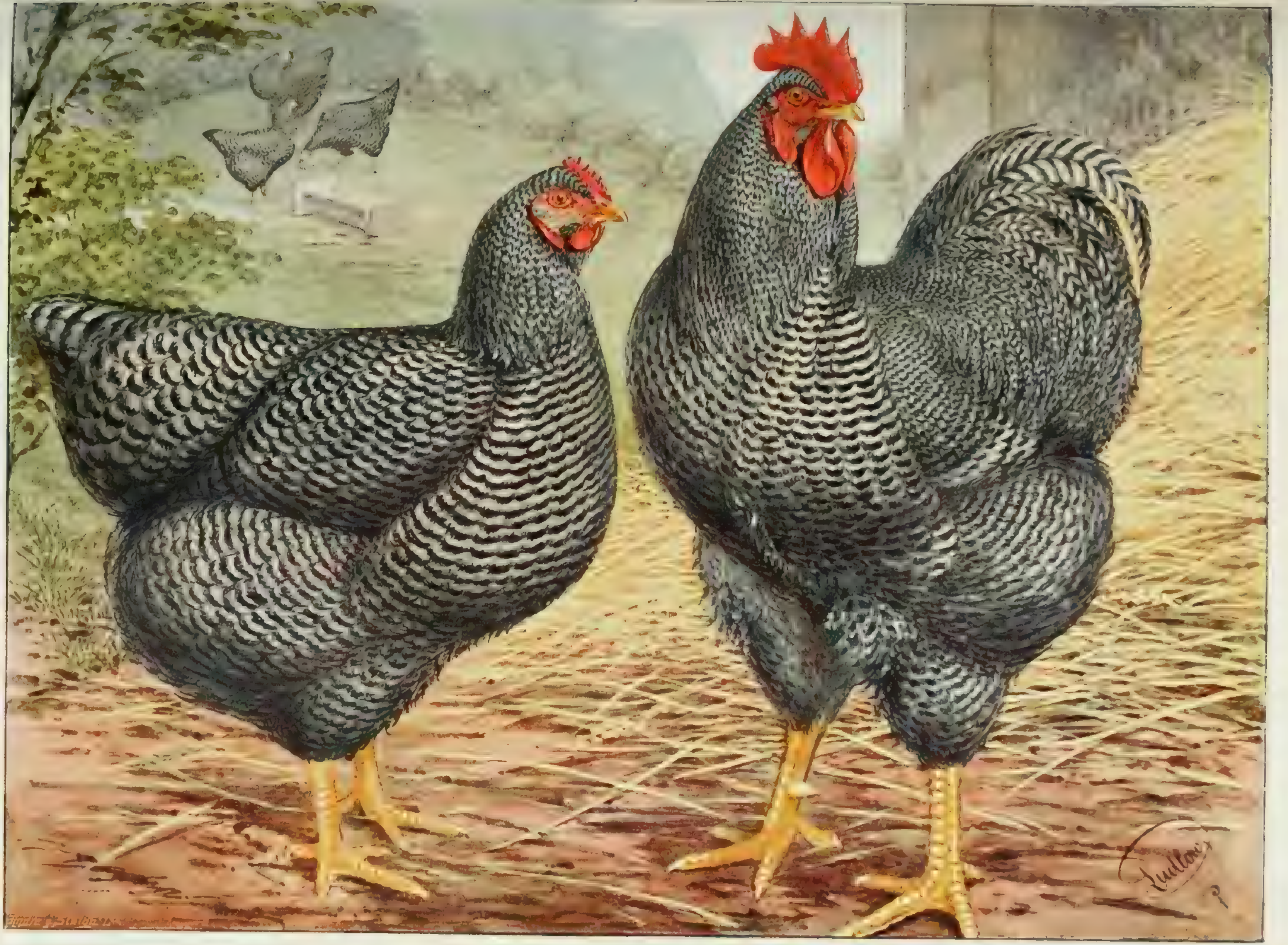
The Barred Rock plumage is not easy to breed to present exhibition standards, and as a rule requires more or less of the system of double mating. In this case the necessity arises from fanciers desiring to make similar in both sexes, barring and colouring which Nature has arranged to be finer in barring and lighter in colour in the males than the females. That would apply to all cuckoo barred fowls; but in this particular case there is the added difficulty of the strong Black Java blood always tending to reappear in pullets, if birds too dark are used on either side[*]; some birds of this kind are inevitable if adequate colour is to be preserved, but they are getting somewhat fewer than they used to be. We do not think breeding is so difficult in England, at present, as it is to the American standard of colour and marking. The following notes are kindly contributed by Mrs. Wilkinson, of Scotforth, Lancashire, well known for her successes in the exhibition pen, and set forth the necessary points clearly.

"The description and systems of breeding given below are based upon experiments personally conducted during the last seventeen or eighteen years; and, as my successes have not been infrequent, it may perhaps be taken for granted that the principles are sound. I will commence by describing, as well as my rarely used pen will permit me, the qualifications required of the breeding stock, and how to mate for the production of youngsters of high-class exhibition merit.

"The chief question has been, shall we retain the old style of single matings, or employ systems whereby we breed separately for the two different sexes? Much may be said for both sides of the question. As an instance of the utility of single mating, it may be mentioned that at the Royal Show of 1898 the first prize winners in both the cockerel and the pullet classes owed their existence to the same parents. Since that date, however, events seem to prove that the would-be prize winner must study his fowls more closely and ascertain which of his stock produce the best cockerels and which the best pullets, and so mate that these newly discovered proclivities may be accelerated. I believe that since the period referred to the most successful cockerels owe their origin to totally different sources from the pullets. There are admitted exceptions, for I have myself bred high-class exhibition cockerels and pullets from the same pen, and they have won first honours at leading events in both classes; and, as late as 1910, the pullet that won the champion challenge cup at the Crystal Palace and all the large shows owed its origin to a pen that produced a few first-class cockerels that were well up at the chief events. Still, in spite of this, during the seventeen or eighteen years of my experience, the majority of the champion winning pullets have been produced from different matings to the first-class cockerels. This fact has converted me to favouring double mating.

"I have bred from a good many pens in each year, and I have found that for breeding the highest class cockerels, the females in the pen must be of very dark rich colour, with good undercolour, with tails well barred to the end, and care must be exercised to have the feathers with black tips. If this was strictly adhered to we should not have so many cockerels with white in tail. Care should also be taken to have the female well built, standing fairly well up with good shoulders. The stock

[*] There is little doubt that some of the so-called Black Javas in America are these black sports from barred Rocks, but have been used as crosses on the older Java stock, which of course soon absorbs them.



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PLYMOUTH ROCKS

male for such a pen must, of course, be a typical exhibition bird, with good straight barring of rich green sheen well defined from the ground colour.

"For exhibition pullet breeding the females should be good exhibition birds with straight, well defined bars on clean ground colour, perfectly even throughout, which, of course, is a great feature in the exhibition pen. The shade of colour is not so important as its evenness, for judges somewhat differ as to the former, but all agree as to the necessity of the latter. Hence it is most important to select all as even as possible. The male for the pullet breeding pen is a bird which is too light for English shows, yet perfectly even and distinct in barring. Such an one has in my yards proved to be the most successful. It is not necessary for this male to be barred to the skin, but he must have good even barring on breast and wing bars, and the latter must be of rich colour.

"On examination every feather of the male and female should possess a ground colour of light blue-grey, crossed at regular intervals from root to tip (with the exception of the pullet breeding cockerel, in which it is not so particular for it to go to the root of the feather) with straight, sharply cut, clearly defined bars of a green lustred black. Brown or bronzy tinges must be totally absent. A fair amount of latitude is allowed in the number of bars on each feather, but in birds which have been considered as near perfection as any yet produced, I have found that the feathers in the middle of the back are marked with from seven to ten bars each, so that those may be taken as about the limits. Birds with bars more frequent may be taken as too fine in that respect, while those with fewer as running too coarse in barring. When a bird is too finely barred the plumage is too cloudy in appearance and lacks definition between the bars and ground colour, a blemish which tends greatly to spoil the attractiveness of the Plymouth Rock.

"The question of under-colour received but little attention in this country up to a few years ago. Totally black or white under-colours have been at a discount certainly, but distinction in barrings below the surface has not been considered a *sine quâ non* in either the exhibition or stock specimens, but during the last few years more stress has been laid on the under-colour, and, hence, more care must be taken in choosing breeding stock.

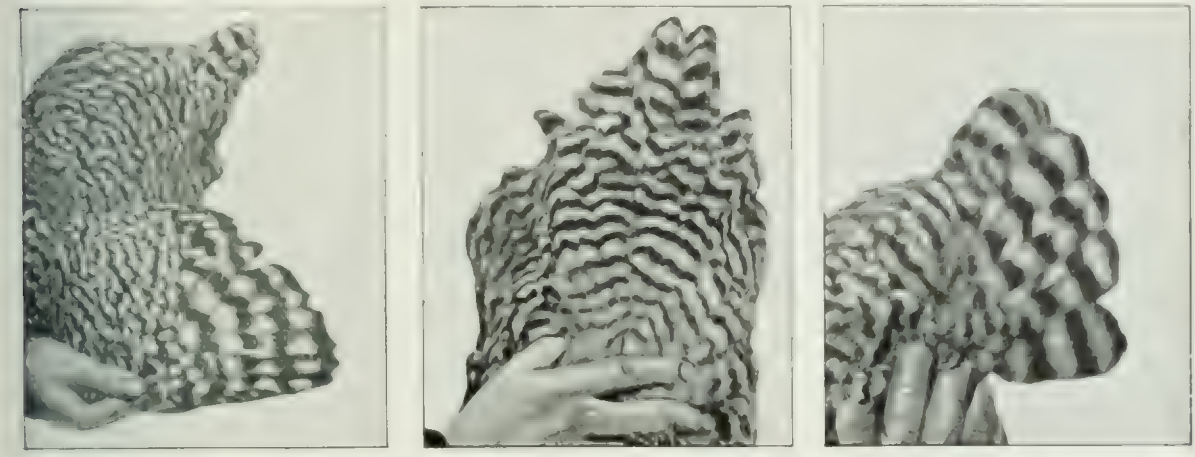

Fig. 97.—American Plymouth Rock Plumage.

"In America they manage things differently; for years they have been breeding to produce barrings to the roots, and from the illustrations in Fig. 97, representing the plumage of an American pullet, it will be seen that the results justify the labour. The photographs show how the under-barrings are developed on the wing, back, and tail, all well cut and remarkably even, not only throughout the body, but also on every flight and tail feather; but to compete with success at English shows, each bar should be a little wider, and therefore the complexion of the whole bird a little darker. There is no denying the fact that these American Rocks have a very pleasing appearance, yet they seem to lack something of that dignity and substantiality peculiar to our darker specimens.

"Be that as it may, such photographs are a reminder that although we can give points to any country on Rocks, taking the birds all round, size included, we are certainly not up to brother Jonathan in under-barring. Fashions are said to rule the world, including the poultry world, and none can say that in a year or two we may not be searching energetically for those barrings which are hidden, and therefore add nothing of beauty to a fowl, but which may probably aid us to breed them truer to type on the surface. This I would rather welcome.

"I appreciate the American Barred Rock, but they lack the lustre in colour; if only they had a green lustrous black barring I feel sure it would add to their beauty, particularly if coupled with longer legs on both males and females. I believe that then both England and America would soon adopt the same standard, which would be very beneficial to both countries, for as it is at present very little trade is done between us and our fancier friends across the Atlantic in Barred Rocks.

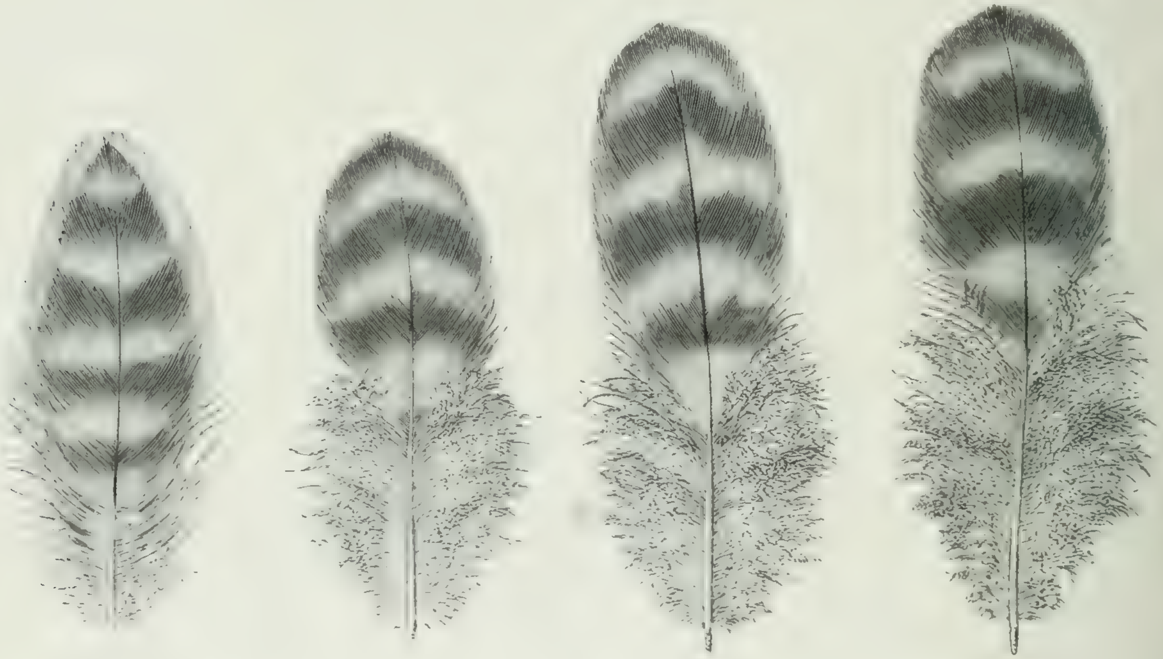
Hackle. Breast. Wing. Cushion.

Fig. 98.—Feathers of Barred Rock Hen, 1872: Broad and Crescentic Marking.

"I have not said much about shape, and so will give just a brief outline of my ideas in this respect. A Rock must be on the large side to be a specimen of much value, not only tall, but broad with good deep body and a long, straight breastbone, and full chest. It should stand straight on good stout legs of rich orange colour; the tail small, compact, and not carried too high. The head should be of good length, surmounted by a comb of medium size, with five points, and perfectly straight and firm on head, and with lobes and wattles a bright red, beak to correspond with legs."

The American Barred Rock differs from the English type perceptibly in shape. The tail of the cock is larger and carried a little higher, though not nearly vertical; the legs upon an average are rather shorter; the body perceptibly longer and more Dorking-like in shape, with less fluff about the thighs than in average English birds, and rather less cushion in the females. All these points tend towards a better layer and better table fowl, with finer skin. The size of the American bird is also smaller, by an average of about 2 lbs. per bird: this is no doubt greatly due to that demand for "broiler" chickens so often alluded to, but American breeders consider that the Rock when bred very large has a tendency to coarseness both of bone and skin, which they dislike.

The plumage has already been described as perceptibly lighter and brighter in colour; the total effect being often that of an almost bright and lightish blue shade. Some years ago it might also have been described as finer or more numerous in the bars; but in this respect English breeders have now adopted American views, as also in preference for straight barring and "ringlet" effect, over the older and coarser crescentic form. In all but lighter colour, in fact, the barring photographed in Fig. 99 would be accepted by an English breeder of to-day: the comparison between it and the coarser crescentic marking of Fig. 98, drawn from a hen of 1872, will show the change in character of the marking in both countries since that date.

For the following notes upon American Rocks and their breeding, we are indebted to Mr. E. B. Thompson, of Amenia, New York, well known throughout the United States as the breeder of what is famous as the "Ringlet" strain.

"It seems unfortunate that there should exist such a difference between the English type of Barred Plymouth Rock and the American type. The difference is very strong, and it is to be much wished that in some way the breeders of both countries should get together on this matter.

"The American standard male is medium to medium dark in colour,* with an even blue shade from head to tail; the dark bars being a black or blue black, but free from any lustre or *metallic* black. My customers across the water, in both Germany and England, demand *very dark* birds in both males and females, the darker the better so long as the birds are clear in colour, and free from brown and smoke. These very dark specimens cannot have the beautiful blue shading that birds medium in colour often show, and which surely adds so much to the beauty of the breed.

"The American type of female is medium light in colour, well barred, and as blue in shading as they can be produced. My experience has shown me that *very dark* females, as we consider them, suit the best in Europe; in fact such females as the American breeders use as their highest type for producing cockerels, being fine in size and shape, well barred, and with yellow legs and beaks. Such hens, while the best for producing cockerels, are too dark for exhibition in America. It seems that the light to medium-light males which are used here to get the best medium-light show pullets, do not take well in England.

"Some breeders here use one style of mating only, called a standard or 'single mating.' Such a mating consists of *medium-light* exhibition coloured females, and a medium-coloured male, a shade or two lighter than the standard American show male. But without doubt the best exhibition Barred Rocks of this country are produced from the double-mating plan, or one mating to get cockerels, and another to get pullets. The first is made up of an exhibition male, of the highest class, mated with hens too dark in colour, well barred and clean, and bred from exhibition males. The pullet mating consists of the best exhibition pullets or hens, mated with a medium-light to light-coloured male, whose dam was a prime show bird. These two matings are not related one to the other. They are *two distinct lines.*

"Herewith I send some feathers from an American standard exhibition male and female, and also from the American type of female for producing exhibition cockerels. These feathers are of the highest type, and show some exquisite barring and the mild blue colour admired here.

"All breeders in both countries, I believe, admire the regular parallel barring in a Barred Rock, which is best described by the term '*Ringlets*,' for when the feathers are properly placed upon the bird, the bars show upon the surface in rings, which make the bird very beautiful. The mild blue colour, together with these 'Ringlets,' combine to make an attractive bird, and the blue colour is certainly lost in too dark a specimen. I wish that the standard for any breed could be the same the world over, and hope that some day not far off this may be so."

Photographs of the pullet feathers sent appear in Fig. 99, but being taken upon a white ground, appear rather lighter than they would upon the bird. They, however, show the scale and distinctness of the barring, which it will be seen extends to the base of the feather; and the last feather, from the cockerel-breeding female, shows the somewhat darker character of the plumage as above described, and would fairly represent the type admired in England. It is obviously plucked from nearer the tail, than the feather next to it from the exhibition bird.

Perhaps no subject has been so fully discussed in America of late, as the mating of Barred Rocks, and the modifications of practice which have taken place are interesting. The original system pursued for many years was rather haphazard: selection was simply made of a good-looking cockerel, which was mated to good-looking females, with little regard to pedigree. The produce of such breeding was naturally of a very mixed character, and about 1885 it began to be abandoned for mating "standard" birds on both sides, with greater attention to "line-breeding." This worked great improvement, especially in the *average* produce, while it gave a percentage of exhibition stock of both sexes sufficient to show that such breeding was practicable, as is also shown by

Various Matings for Barred Rocks.

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* This definition has to be read through American spectacles. What is called "medium dark" would be perceptibly lighter than English standard, and "medium" considerably lighter.

Mrs. Wilkinson's notes above. Some American breeders of repute have never abandoned that method; but the majority were not satisfied with the results, especially in brightness of colour and distinctness of barring, and hence came in the system of double-mating described above by Mr. E. B. Thompson. It will be observed that this system is more complicated than that formerly adopted by breeders of using similar females in both pens, with a rather dark cockerel to breed cockerels, and a rather light one to breed pullets; the females keeping the strain related or in union.

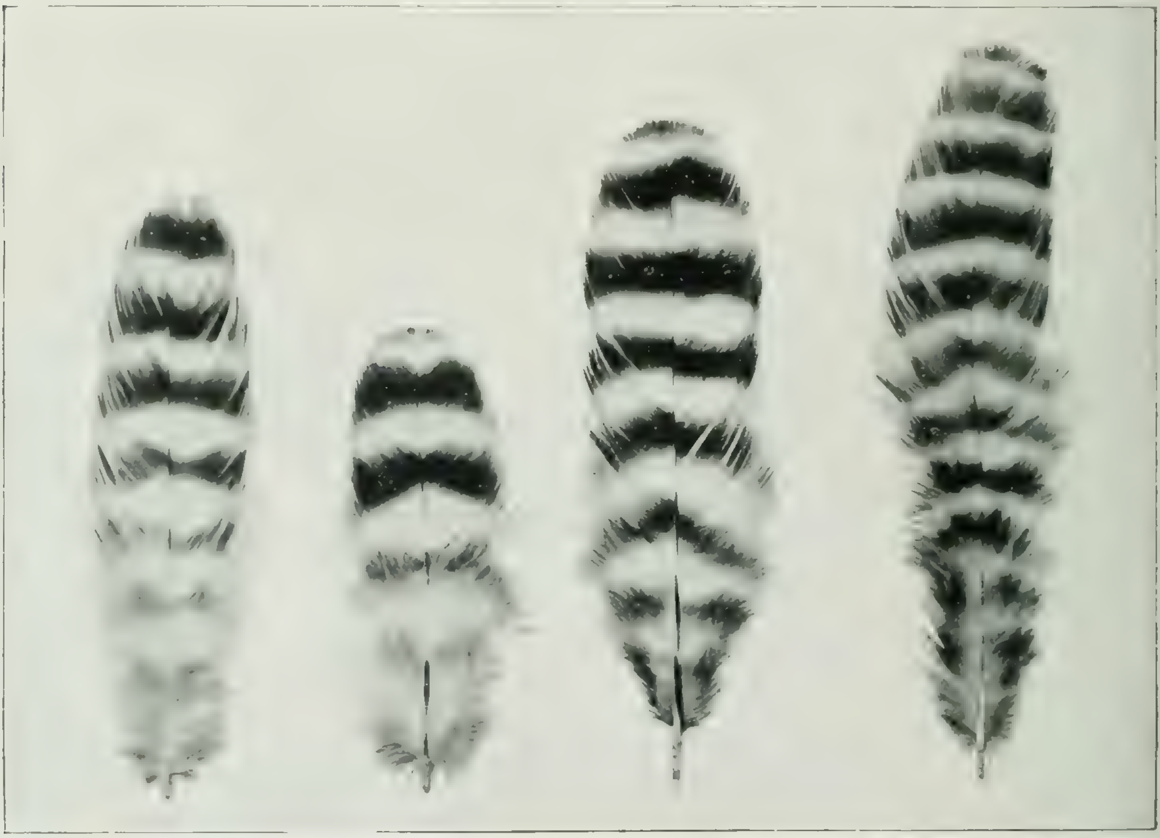
Hackle. Breast. Cushion. Cushion, Cockerel Breeder.

Fig. 99. Feathers from American Barred Rock Pullet, 1901.

In America at the present time there is a tendency among some judges to give preference in the show-pen to birds that have strong under colour, type apparently being a secondary consideration with them. And it is not infrequent that specimens of angular contour, narrow bodies, shallow breasts, and by no means brilliant top colour, are found high up in the prize lists. To such an extent has this been the case that some prominent breeders have not hesitated to point out that if birds that only "handle well" continue to monopolise the prize-money, the once deep-breasted, long-keeled, broad-backed male and the long, broad-bodied female which is such an excellent layer, will become defunct.

Commenting in a recent article* on the mating of barred Plymouth Rocks, Mr. A. C. Hawkins, one of the most famous of American breeders, says:—

"Modern Barred Rocks are bred by the double mating system, which requires a special mating to produce exhibition cockerels, and a special mating to produce exhibition pullets.

"The cockerel mating should be headed by a male as near the perfect type and colour as possible. Select a bird with a medium-sized, evenly serrated comb that sets firmly on the head, a rich red eye and a deep full breast with long keel. Have the body and back broad with a concave rise from the hackle to the tail. The tail should be well spread and not carried above thirty-five degrees. He should have strong yellow legs, set well apart. Select a male of this type that has a clean cut, sharp, even surface colour, with a snappy blue tinge, absolutely free from any trace of smutty or brassy colour and of the same shade from head to end of tail. The wings should be clearly and evenly barred and the tail barred to the skin. Select a male with this brilliant snappy surface colour that also has clear, evenly barred under-colour well down, but do not expect intense heavy under-barring in a male with brilliant surface colour. Let nature have its way with the under-barring and it will give you a more attractive surface colour and a more beautiful bird all over, with all the barring that a rich-coloured bird should have.

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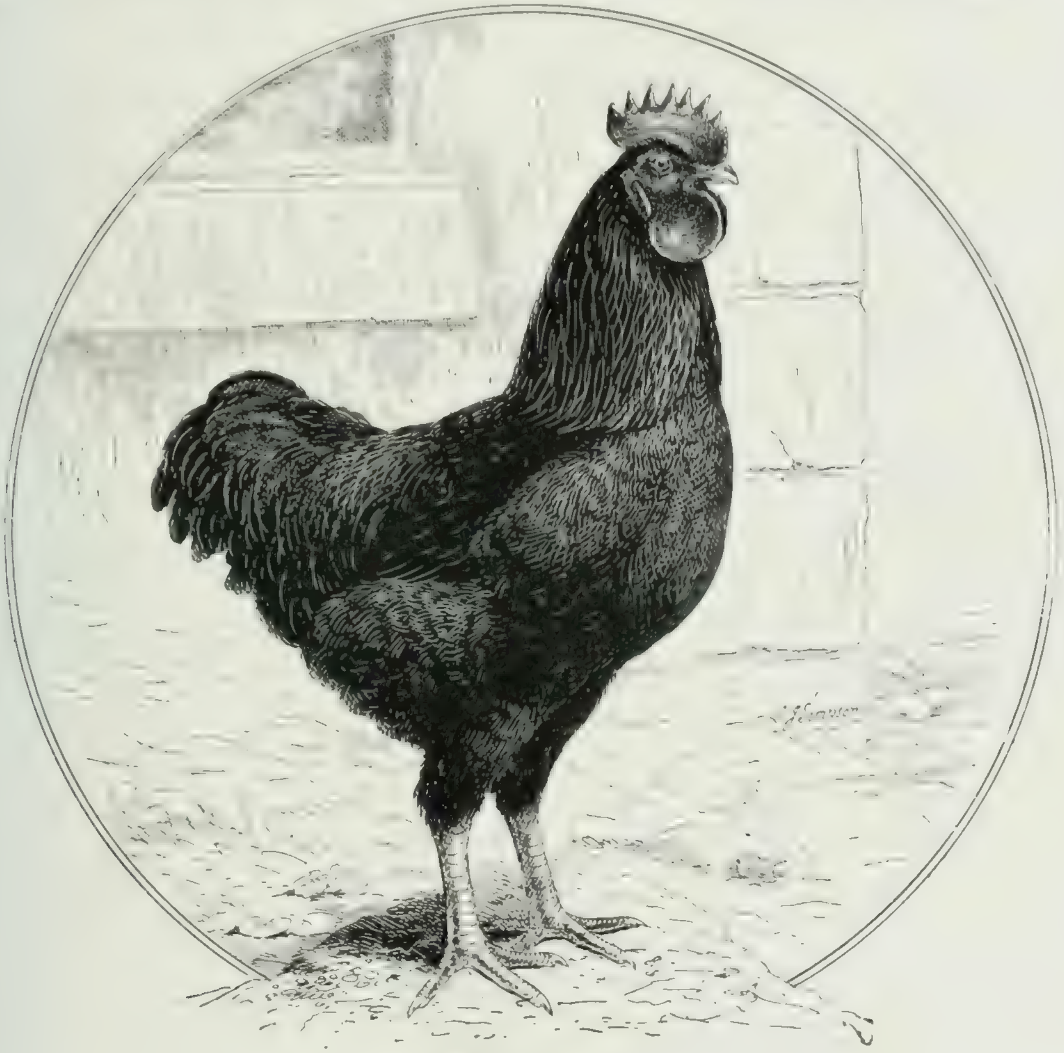
* *Reliable Poultry Journal*, March, 1911.

"I prefer a male not much above Standard weight to insure vigour and early maturity. Coarse, long legged males are not desirable breeders, and we do not wish to favour extra heavy birds. It is quite important that the male in a cockerel mating should be directly descended from a long line of high class exhibition males, as very often some of our very finest show birds inherit some of their valuable characteristics from their grandsires.



Black Rock Cockerel.

"In selecting the females for a cockerel mating, I use hens or pullets with long, deep bodies, full, broad breasts, medium low tails, well serrated combs, bay eyes and yellow legs. The surface colour of the females should be well defined in all sections, with clear, distinct barring in wings and tail. The under-barring of the females should be narrow and well defined to the skin, in all sections, with straight, clear neck barring. This intense under-barring in the females will give the cockerels in the progeny all the under-colour they will need, and they will inherit the brilliant surface colour from the male. One of the most important features in selecting the females for a cockerel mating is to have them bred from a long line of exhibition males. With this kind of a cockerel mating you should produce a large percentage of high quality males for breeding and exhibition.

"For the mating to produce exhibition females, I select a male of medium light colour with narrow, even barring throughout. The wings and tail should be very clear in barring and the under-colour should be clearly defined in all sections. Select a male with low, evenly serrated comb, yellow beak and legs, long keel, with deep full breast, broad back and low-spread tail. This male should have high-class exhibition females for dam and grand-dam as this is very important if we are to secure the best possible results from the mating.

"The females in a pullet mating should be high-class exhibition specimens of Standard specimens of Standard size, with deep bodies, full breasts, broad backs and low-spread tails. Have them clear in under-barring throughout, and with narrow straight bars in the neck section and clear even barring in the wings and tail. The ringy appearance in the surface colour of the female is most desirable in show specimens and in breeding birds. Do not use a female because she is good in under-colour unless she has the surface to make her attractive. A Barred Rock that does not show well at sight is not suitable for the show room and should not be considered a first-class breeding bird. Select females with low, evenly serrated combs, and with yellow legs. From such a pullet mating you may reasonably expect a large percentage of choice females.

"For thirty years I have seen the Barred Rocks improve in some characteristics and go backward in others. The breeders of to-day should keep in mind the practical qualities in framing the Standard for the breed and should request the judges in placing the awards on Barred Rocks to give more attention to correct type and surface colour and not to be misled by intense under-barring.

White Rocks.

"The White Plymouth Rocks," writes Mrs. Wilkinson, "are beyond doubt a pure variety, owing their origin to sports from the Barred. These have not been so frequent in England as in America. They are believed to have been first preserved and cultivated by a Mr. Frost, of Maine, about 1880, and later they were brought to about perfection by the late Mr. Harry W. Graves, of Higganum, Conn., who won almost all the prizes at Madison Square for a few years before his death. In 1905 Mr. Graves sold the champion male for one thousand dollars, so there is no question of the variety's popularity in America.

"It is said that Whites are easier to breed than the Barred variety. No doubt that is true to some extent, but to breed a typical bird of pure white with good orange yellow legs and beak, with face, comb, earlobes and wattles red, is difficult enough, and when attained the result is truly a beautiful bird. White birds, as a rule, have a tendency to straw colour or sun burn, but White Rocks in the best strains have almost overcome this and now rank amongst the most perfected varieties in existence, especially so in America, and also in one or two English yards. White Rocks should correspond in shape and size with Barred Rocks, and although not so popular they possess better utility qualities.

Black Rocks.

"Black Plymouth Rocks are also sports from the Barred variety. It is seldom that a cockerel is thus produced, but pullets are very prevalent in some strains. A few enthusiasts have bred them exclusively and produced some handsome specimens. They are of the same shape and size as the Barred, and have a good lustrous green-black colour with grand yellow legs and beak; bright bay eyes, red face, comb, wattles and earlobes. The contrast is certainly very becoming, and, moreover, the blacks are undoubtedly very good layers and useful table fowls. They develop more quickly than any other of the Rock family, and yet have the smallest number of followers amongst breeders who breed them pure, though several breeders mate them up to their Barred Rock cockerels to improve the colour of the latter."

Buff Rocks.

There is also a Buff variety of the Plymouth Rock now widely bred and exhibited, but which obviously cannot be considered any true descendant of the original. In the United States its chief component has undoubtedly been the Buff Cochin; in England some of the stock has come from America, but more owes its origin chiefly to the Buff Orpington or Lincolnshire Buff. There is little doubt that the one "breed" was in England at first largely bound up with the other, quite a number of breeders exhibiting both, and putting a bird into either class according to the colour of its shanks. Such a double refuge for produce was highly convenient in many ways, for the exhibitor; but it was not so good for either variety, in the long run, and there is little doubt that some of the difficulty about yellow shanks occurring in Buff Orpingtons, has been due to the allied Plymouth Rock blood, which has both given encouragement to yellow, and sent it back again into the white-legged strain. The only remedy for this, as already intimated, is greater insistence upon true type or form, in both breeds.

The following notes upon breeding Buff Rocks are also kindly supplied by Mrs. Wilkinson, whose successes in this variety have been well known :—

"A Self-colour is not so complex as a bi- or tri-colour, and is therefore simpler to describe, but the production of either black, white, or buff self fowls is not so easy as the uninitiated would imagine. In the past there have been many heated discussions on the correct shade of a Buff Rock, but at present all is serenely peaceful, one shade being generally accepted as the ideal. This shade can best be described by comparing it to the colour of a new golden sovereign, which it exactly resembles. Of course a little latitude is allowed, especially in the stud birds, provided softness and soundness are retained,—all hard bricky colours are most undesirable.

"Buff fowls should have one colour and one only, from head to tail, and from root to tip of each feather, with not the slightest suspicion of lacing round the edges of the feathers (generally found at bottom of breast and wing bars), nor yet possess any feathers which are 'mealy'—a sprinkling of tiny white spots like meal, generally clustered round the quills on the wing butts, but occasionally all over the body. These two defects, along with black or white undercolour, are infinitely more to be dreaded than a little black in tail or flights, and should never be allowed in the breeding stock. White should be entirely absent from young stock, but as quite 90 per cent of the good youngsters show white after the first moult, we are obliged to allow a little after this period, but even then, only a touch on flights and tail.

"I have described colour first, but I believe shape ought to have had that position. It has often been truly said that shape makes the breed, colour the variety; and this most particularly applies to the Plymouth Rock family. The Buff Rock should have the shape described above for the Barred variety, and not that of a moderated Cochin, like many that were exhibited about 1895 and 1896. Short round heads, huge cushions, and an abundance of fluff, are not Plymouth Rock properties, and should be carefully avoided.

"When mating this variety, select birds which comply as nearly as possible with the above description. Don't use a bird because of its surface appearance, but be satisfied that it is sound to the skin, and that it comes from a strain which has been carefully bred to type for years back.

"An article on Buffs, at the present time, would be incomplete without some reference to colour feeding, so I will conclude with a few words on that subject. A few years ago every prominent breeder of Buffs was under suspicion for colour feeding; why, I cannot say, for it has never, to my knowledge, been proved that it is possible to improve a Buff in colour by feeding. It may be possible to make a light colour darker, but even if so, I feel assured that the lovely soft tones one has become accustomed to see, will never be attained by other means than skilful breeding."

There is nothing to add to these observations, with those previously made upon breeding Buffs in general, under the headings of Buff Cochins and Orpingtons. It may perhaps be remarked that upon the whole this colour is about as easy to breed in Rocks as in any variety, the rich colour desired in the shanks harmonising and working in well with that sought in the plumage. For this reason it will be found, comparing two average classes, that the colour in the Rocks is as a whole slightly richer and sounder than in Orpingtons.

All the varieties of Plymouth Rocks have also been bred in America with *pea-combs*. Some of these are probably sports, from the original Brahma cross which has already been stated to have existed in the Drake strain; others have been avowedly produced by a fresh cross with the Brahma. The danger of frostbite in some parts of the States causes a preference for the pea-comb in itself, among some farmers, which does not exist in England; but in spite of this such varieties do not appear to extend much, and in England have never taken root at all. *Partridges* have also been shown, but such attempts to multiply varieties that can have really nothing in common with a breed of real character and value, are rather to be deprecated than encouraged.

There is another Rock, the Rose-comb Barred, which has been consistently championed for several years by Mr. and Mrs. Wm. Rice, of Rettendon, Essex, who claim that it is a genuine "sport," a reversion maybe to the (rose-combed) Dominique, already referred to; one of the ancestors of the Rock, and of which a coloured illustration appeared in the first edition of this work. A cockerel secured third prize in 1908, and a pullet gained second prize in 1910, in the A.O.V. Class at the Dairy Show, but the Rock Fancy does not take kindly, at present, to the sub-variety, while the Poultry Club has deferred "recognition."

Judging Plymouth Rocks.

In judging Plymouth Rocks the greatest needs at the present day are two. The first is a more definite understanding respecting colour and marking, concerning which there seems a great want of consent or unanimity amongst different breeders and judges, arising no doubt in part from the real difficulty in describing even any given specimens, to which we have already referred. Present signs point rather to the probability of a somewhat nearer approach yet—already made to some extent—to the lighter and more sharply barred American ideal, though probably not to the degree seen in many American cockerels, some of which are almost black and white, and do not stand sun or exposure at all well. The other point needing attention, we must once more emphasise, is form or type. A Rock not of a good table form has no justification for existence; but we still see many such, with legs too long, and deficient breast, and narrow bodies, and fluff showing far too much of the Cochin ancestry. More consistent judging would do much to stamp out such faults, and is especially necessary in cases where, as in the Self colours, other breeds of similar colour require to be in some way distinguished.

The Standard of Perfection of the Poultry Club for Plymouth Rocks is as follows:—

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Strong, but not thick. *Beak :* Short and stout. *Eyes :* Large and bright. *Comb :* Single, of medium size, straight and erect, with well-defined serrations, and free from side sprigs. *Face :* Smooth. *Ear-lobes :* Of fine texture, well developed and pendant. *Wattles :* To correspond with size of comb, and moderately rounded.

Neck.—Of medium length, thick, and profusely covered with hackle feathers, which should flow well over the shoulders.

Body.—Large, deep, and compact. *Breast :* Broad and well rounded. *Back :* Broad, of medium length. *Wings :* Medium sized, carried well up, the bows and tips covered by the breast feathers and saddle-hackles.

Tail.—Rather small, rising slightly from the saddle, the sickles and coverts of medium length and nicely curved, the coverts being sufficiently abundant to cover the stiff feathers.

Legs and Feet.—*Legs :* Wide apart, stout, and strong, thighs two to three inches long (from hock to body), with shanks to correspond. *Toes :* Four on each foot, strong, straight, and well spread.

Carriage.—Upright and graceful.

Weight.—10 lb. to 12 lb.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—8 lb. to 10 lb.

COLOUR

Beak : Bright yellow. *Eyes :* Clear, rich bay. *Comb, Face, Ear-lobes, and Wattles :* Bright red. *Legs and Feet :* Bright yellow.

THE BARRED

Plumage.—Blue-white ground, each feather barred across with bands of black of a beetle-green sheen, the markings to be moderately narrow and of equal width, and the colours to be sharply defined and not shading into each other, the barring to continue through the shafts of the feathers and into the fluff and under-colour, and each feather to finish with a black tip.

THE BLACK

Plumage.—Black, with a beetle-green sheen.

THE BUFF

Plumage.—Clear, sound, even buff throughout to skin, any shade from lemon to orange, at the one extreme avoiding washiness and at the other a red tinge.

THE WHITE

Plumage.—Pure white; straw tinge to be avoided.

SCALE OF POINTS

THE BUFF

Colour	35
Type	20
Size	15
Condition	10
Head	10
Legs and feet	10
	100

OTHER VARIETIES

Colour (including tail 10, in Barred)	30
Type	20
Size	20
Condition	10
Head	10
Legs and feet	10
	100

Serious defects : The slightest fluff or feathers on the shanks or feet; shanks other than yellow; white ear-lobes; black, red, or white feathers in the Barred; other than black feathers in the Black; spotted hackle or saddle, mealiness, any black or white in the wings or white in the tail of the Buff; any coloured feathers in the White.

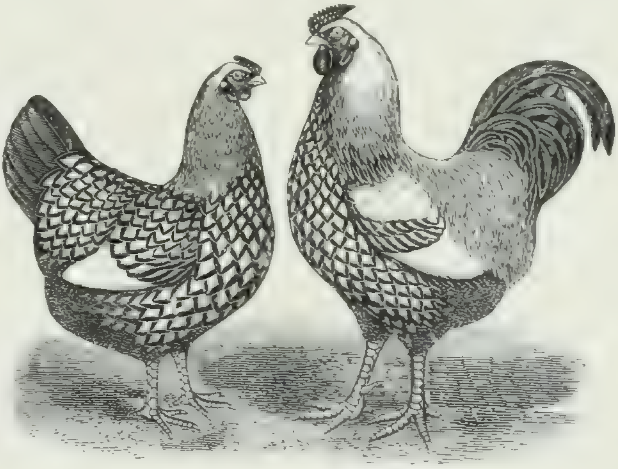
CHAPTER XX.

WYANDOTTES.

IT does not appear possible now to determine either the precise origin of the Wyandotte, or the date of its production, respecting which a great deal has been published that is self-contradictory and certainly erroneous. We can only state one fact, but that is from personal knowledge and recollection. We saw every issue of all the earlier American poultry journals, and it was in 1873 that large laced birds were *first* mentioned in these, under the name at that date of Sebright Cochins, and with the general description that they had been produced by crossing Cochins with Silver-spangled Hamburghs and "other blood." These birds were figured and described as with smooth yellow legs and rose-combs, which latter, according to illustrations of the time, did not turn downwards at the back as now, but were far more Hamburgh in character and somewhat larger, as can be seen in the illustration we have reproduced a few years later in date than this, but of these earlier American birds. The lacing in this illustration is a great deal idealised, being much better than anything really seen at that time, but the Hamburgh type of comb, as then bred, can be recognised distinctly. In the main, however, though perhaps slightly less cobby in shape than the present birds, there are all the characteristic features of the Silver-laced Wyandotte, which was the original type of all the varieties now known under that name.

History of Wyandottes.

As Sebright Cochins, or American Sebrights, a name which was also given to these birds, they never became widely popular, and it is somewhat uncertain whether this original stock did not die out. The name was not American or distinctive enough for popularity, and for several years it is difficult to trace any such fowls at all. But about 1880 similar large laced birds began to be freely written about again, and it is significant that regarding these, there was always an impression, and there were many actual statements, that the Light Brahma had been the Asiatic race employed. They were now also termed Wyandottes, and the comb, while still rose in character, had assumed that downward curve at the back and of the spike, parallel with the top of the head, which is now a recognised Wyandotte point. This kind of comb would probably result from a Brahma cross; and upon the whole the evidence, though not conclusive, tends to show that some time before 1880 the Wyandotte had not only been re-named, but actually re-made, upon a Light Brahma and Hamburgh foundation, with possible aid from Polish stock, as "crested" birds are mentioned in one account we have seen. The first importation we were able to trace into England, was one by Mr. J. Pilling, of Ashton, near Chester; and the first *English-bred* specimens to be exhibited were, we believe, shown by Mr. T. C. Heath, at the Staffordshire show of 1884. The history of the breed in England, therefore, only dates from that time; and the progress made since, both in popularity and multiplication of varieties, is remarkable.


Early American Wyandottes.

This is not without solid reason, for the Wyandotte is an undeniably valuable and generally useful fowl. It is a capital layer of tinted eggs, when bred with any reasonable care to maintain that property; is very hardy and easy to rear, feathering well and easily in

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chickenhood; is a capital sitter and mother, though not excessively broody; and is a very fairly good table-fowl. In this last respect it cannot stand so high in England as in America, where they prefer that yellow skin and shank which in England are rather disliked; but even in England it is beginning to be understood that a yellow-skinned bird may be excellent eating, and is sometimes more juicy than a white-skinned. It is a bird with capital breast and wings, at all events; and at the Smithfield show of table poultry in 1894, where all other breeds besides Dorkings and Surreys and Games had to compete in one class, the winning pullets were Wyandottes. In regard to laying qualities, it may be noted that in America, where fowls have been more persistently bred for laying than anywhere in the world, the White Wyandotte has slightly exceeded the average of any other breed, so far as we have been able to ascertain.*

Apart from the plumage which distinguishes each of the varieties, the general characteristics of the Wyandotte are few, marked, and easily described. The head should be short and rather broad, the Brahma ancestry being here clearly traceable. The rose comb is smaller and narrower than a Hamburgh comb, and the back and spike or leader should curve rather downwards, parallel with the top of the head; this comb is typical of the breed, and should be preserved, otherwise it should be neat and full of "work" as usual in rose-combs. The face, ear-lobes, and wattles are smooth and fine, and brilliant red. The neck-hackle of the cock should be full and flowing, the back short, the saddle rising to the tail in a nice curve, the tail well filled up and sweeping, but rather upright. The body is very full and broad in breast, and deep, but not very long; rather what the Americans call "cobby" shape. This cobbiness, on medium or rather short shanks, is the characteristic type of the Wyandotte.

Silver Wyandottes.

The recognised head and original of the Wyandotte family is the Silver or Silver Laced. In this variety, the head of the male is silvery white, the hackles lower down becoming striped with dense black, as also are the saddle hackles. The back is silvery white, as are the wing-bows; the principal wing-coverts white, broadly laced with black, forming good laced bars across the wing; the secondaries are black on the inner web, and white with a broad black lacing on the outer web, edging each visible feather with black. The breast and under parts are white laced with black, from throat round to back of thighs, the under-fluff slate or dark grey; the tail black with green reflections. The female has also a white head and striped hackle, and black tail, and secondaries of the wing as in the cock; the rest of the body white, with each feather laced round with black, the tail-coverts approaching that character as far as possible, or with a white centre to the feathers. Regularity and rich density in the black lacing is the main point in the value of the marking.

For the following notes upon breeding and exhibiting, not only Silver Wyandottes, but their allied varieties, of Golden and Buff-Laced, we are indebted to the late Rev. John Crombleholme, of St. Mary's, Clayton-le-Moors, Accrington, who was recognised as one of the highest authorities regarding them in this country, and also as one of the most successful breeders:—

"Without entering into the origin or history of the Wyandotte, of which there is little to record, I will merely discuss here the points, the breeding, and the exhibition of our most popular fowl; and it may be well in the first place to refer to the general characteristics which apply to all the varieties and distinguish them from any other breed, and by which we recognise them as pure-bred Wyandottes. Here shape should have precedence, and we must combat an impression which the Americans seem to have, that we are not at one with them in this essential. The recently revised Standard issued by the Poultry Club and endorsed by our special Club, does however describe the breast as full and round, the back broad and short, the neck well arched and of medium length, the tail well developed and carried rather upright. Here we have a general outline of the body which is suggestive of a cobby or blocky bird, especially when we add that the legs should match the *tout ensemble* and only be of medium length. Our ideas of a standard bird cannot therefore differ to more than a degree or two from those of the originators; and any differences in practice, or in the pens, can only arise from our temporarily fastening attention chiefly upon the more difficult points of colour and lacing, which as regards all varieties, is the English habit in breeding. There have been and are many birds shown, whose outline is far from coinciding with the Standard, and some of these have won at our best shows; but it is only fair to record that they have been beautifully laced. No doubt in the

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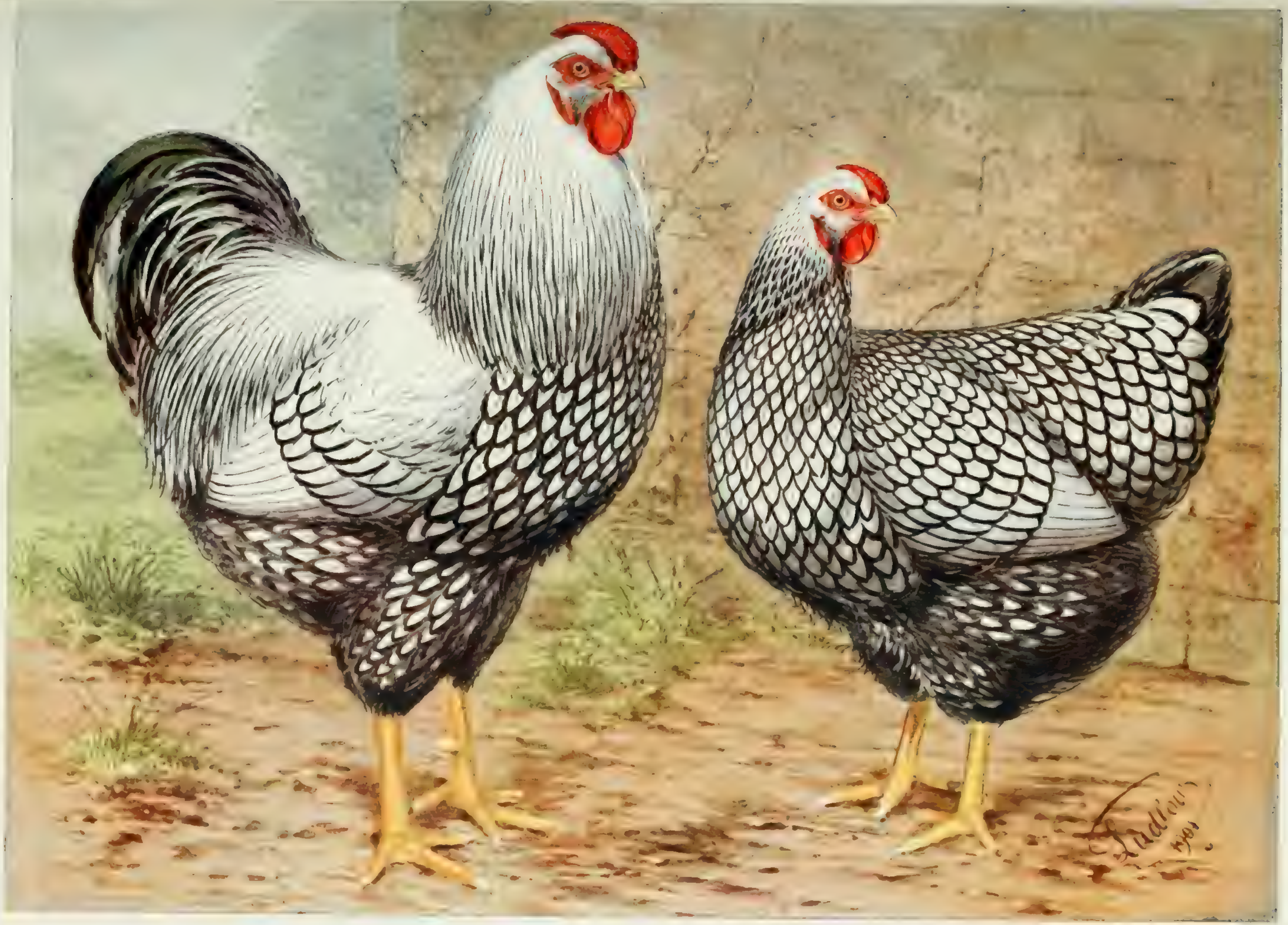
* It [illegible] with fresh egg-[illegible] [illegible] papers [illegible] written, of such as came under our notice, the highest single score, and the highest general average, were conceded to the [illegible] country, [illegible] Australia [illegible]



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SILVER LACED WYANDOTTES.

race for perfection of markings, and for the more modern fashion of open centres, shape has not always been sufficiently considered by some breeders, who find that their customers insist upon clear and open lacing as a *first* consideration in all purchases. But calling to memory the great winners of a few years ago, there is little room in their case for complaint as to their shape. Those who saw the winning Silver cockerel at the Dairy in 1897, and the unstinted admiration accorded to him, will remember that he was not perfectly marked, his hackle running rather dark, and his breast showing faint signs of splashing at the base; but he had a beautiful outline, and was an immense blocky cockerel, rather on the dark side, with massive frame, thick legs, and green-black sheeny lacing. £30 was offered and refused for him, and I myself heard an interested American remark: 'My! isn't he a Jimmy Dandy?' The same may be said of the winning Silver cockerels at the Dairy and Palace shows of 1898, and in a still greater degree of the two magnificent Gold cockerels that won first and second at the same two shows in 1899; the sensation they caused still pulsates in the fancy. There might also be cited the White Challenge Cup cock of 1899, and the White and Buff winners at the Dairy in 1900. Whilst these may seem ancient history, they are yet winners that most fanciers of the breed have seen, of which no one can dispute the standard shape and excellence; and we may not judge the progress of a breed by the common run, but by the best specimens.

"So far then as either ideal, or as the best actual birds go, shape is not different with us; but amongst the rank and file of the classes there may be some justification for the complaint, and it should be heeded. There are two causes which partially account for narrow long backs and undeveloped breasts. One is an excess of in-breeding; the other, mating together stock which is too young. The best breeders are now aware of the effects of this, and are more careful in their matings.

"Passing now to the divisions of the Wyandotte, and beginning with the Silver Laced, let us clearly understand what is meant by its distinguishing attribute, the silver-laced feather. Such feathers we find on the breast, fluff, and thighs of the cock, and on the body of the hen. We may define it as a white feather edged round with black; the centre should be pure white, and not a creamy tint, and the edging quite black in a true light, side-light often showing up the black with a lustre of beetle-green. This adds to the quality; but if the black shows a tendency to grey, it is deemed a fault in proportion as the green sheen is looked upon as an acquisition. The laced feather should be broad, but the lacing itself narrow; the broader the feather and the narrower the lacing, providing the combination possesses the distinct black and white, the better. Naturally the feathers at the shoulders and at the base of the hackle in pullets are narrower than the cushion and breast feathers, and it is quite impossible to obtain a bird in which the lacings are put on equidistantly all through; yet the nearer we can get to the ideal of equal and level lacing, the better.

"There are various kinds of faulty laced feathers to be found; and as it frequently helps the imagination, and impresses the true ideal feather more vividly on the mind to study the matter in that way, let us see what these faults are.

"1. The *double-laced* feather.—This is a feather with a frosted edging, or an outside fringe of white bordering the black (Fig. 100*). The black lacing should be clean cut, and show no white on the border. It is not often that we find the double-laced feather on the back or wings of the female, but it is frequently seen on the breast, and more especially at the throat. This fault is very difficult to eradicate. Cocks in many cases exhibit the same weakness, but not generally in so marked a degree as the females.

"2. The *spangled* or *horse-shoe* feather is a worse fault than the double-laced feather. The term means that the lacing does not run round all the feather, but only partly round it in the form of a crescent (Fig. 101). Breeding from light-coloured stock is chiefly to blame for this defect. Again, it is at the throat, and on the breast of the hen, that we most frequently discover this weakness.

"3. The *almond* feather versus the *rounded* feather. A difference of opinion did exist at one time as to whether the almond-shaped feather, such as we admire and breed for in Sebrights (Fig. 102), or the round and broad feather (Fig. 103), is the handsomer on a Wyandotte. It is true that the best black and white Wyandotte perhaps ever shown, possessed the almond-shaped feather, but then the centres were narrow, and a preponderance of black lacings seemed rather to overbalance the correct juxtaposition of the two colours. Hence the term 'heavy-laced.' Little by little public taste has come round to the broad feather, with large white centre, rounded extremity, and narrow lacing. If the broad-feathered specimen were placed side by side with an almond-shaped one, and each perfect in its respective class, nine out of every ten fanciers would see more beauty in the former. Unfortunately a great difficulty presents itself in breeding good open-centred laced Wyandottes, for in the endeavour to increase the volume of white, not only have the black lacings narrowed (which is desirable), but they have lost considerably in intensity of black, and we seldom find an open-centred bird whose lacings are not inclined to grey.

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* These figures will be found on a separate plate.

"4. The *mossy* feather is the *bête noire* of all silver and gold laced Wyandotte pullet breeders. Instead of the feather having a clear white centre, it is peppered with black or grey ticks (Fig. 104), destroying entirely the essential requisite of a true lacing. The mossy feather is eternally appearing even when the greatest care has been taken in mating up, generally on the back of the female, sometimes under the hackle, and oftentimes on the wing itself. When a judge sees a collection of such feathers on a hen or pullet, he wastes no time in searching for good points, but passes on to the next exhibit; so let young fanciers keep such birds at home, and save both entry fees and railway expenses.

"5. There is another faulty feather, called *ticked* at the base. It may be apparently clear and well defined at first glance, but if we examine closely, we find that at the base, or where the web begins to be separated from the fluff, the white is disfigured by streaks of black to a certain extent (Fig. 105), but generally not more than what we might call a splash. Being confined to the unseen part of the feather, this is not a great fault, and should only be taken into account when separating two good birds for prizes.

"6. Sometimes the definition of the black edging is faulty. Instead of a clean inside edging we see a zig-zag line of black as in Fig. 106, or streaked as in Fig. 107. This failing is mostly noticeable on the breasts of cocks, especially on the lower parts.

"All that has been said of the faults of the laced feather on hens, is equally applicable to the laced feathers on cocks. But there is another point to breed for in the male bird, and that is, top-colour. All who have seen a laced Wyandotte cock will have observed that the top-colour is totally different from that of the hen, both as regards shape of feather and style of lacing. The cock with a perfect top has his neck and saddle hackle of a silvery white colour, and down the centre of each feather there should be a narrow, sharply defined black stripe (Fig. 108). Faulty tops may be threefold.

"1. The *sooty* top, in which the black stripe is generally to be seen, but the silvery edge of the web is replaced by a greyish black, which is termed sooty. The general effect of this loss of pure silver colour is well described by the term applied, or by the word 'rusty' or 'smoky.'

"2. The *brassy* top.—Birds with this drawback have their neck and saddle hackle spoilt by a tanned appearance, as though they had been running out for some time in the sun. It is not caused by the sun generally, but bred in them. The same fault is peculiar to all cocks with a light or white top-colour, such as white Leghorns, silver-grey Dorkings, etc.

"3. The *plain* top.—That is, a pure silver top-colour without any stripe along the centre of the feather.

"A cock's breast should be evenly laced from the throat to the base of the breast, and also on the thighs, and even into the fluff. Some cocks are what is called 'blind' at the throat, that is, the feathers are almost entirely black, or perhaps with a faint centre of white; lower down towards the middle of the breast the feathers open out in better style, and finish off too open; in other words the lacing 'runs out.' This is a bad and faulty breast, and to breed for *cockerels* from such a male bird is very unadvisable. Everybody knows that white in tail or white in ear-lobe cannot be admitted. The wing-bar feathers should be laced distinctly all round, and as evenly as possible, just as the other laced feathers on the Wyandotte are. They too can have the faults of being mossy, splashed, and horse-shoed.

Breeding Laced Wyandottes.

"How to mate up to breed exhibition or standard birds is a question not yet solved in its entirety; but certain fixed principles guide all the better breeders in their choice of mates. The object of the fancier is to get chickens that will score the highest possible number of points in the show-pen. Experience has taught that whilst it is possible to obtain good cockerels and good pullets from the same pen, it is far easier and much surer to breed from two pens, one mated up to produce standard males, the other to produce standard females. This is the principle of the double-mating system. Much has been written against the double system, but nothing from the pen of any well-known successful Wyandotte breeder. In my own yards I once had a strain (Wood's) that bred both good pullets and well-laced cockerels from the same pen, but the cocks were inclined to be brassy-topped, although the pullets that were produced from the same mating never showed the least sign of soot or brassiness in their hackles. These brassy and sooty-topped cockerels I mated again to the whitest pullets, and similar results followed: namely, clear, well laced pullets, and faulty-topped cockerels. In fact, one of the best Silver pullets ever shown was bred from a cock very bad in top-colour. From this experience I deduced that top-colour in cocks does not affect the sound lacing in pullets bred from them, and in choosing my pullet-breeding cocks, I never regard the top colour now.

"Another important item needs to be noted, namely, that pullets bred from a standard-breasted cock often run light at the throat. It will be found that the best breasted cockerels often have their own sisters with light breasts. An observant breeder, then, will not choose perfect-breasted hens to put in his cock-breeding pen, but those that are inclined to run light, and mate them to a perfect breast-laced cock on the dark side. It was this mating that produced my 1897 champion silver cockerel.

"But the chief point to regard, or rather to disregard, in cock breeding, is the cushion of the hen. This may be as mossy as a pepper-castor, and yet the bird be a splendid cock-breeder. In other words, the feathers on the back of the female have no influence on the progeny of cockerels in the saddle hackle; they influence top colour in no sense whatever. This should be apparent. The feather on the hen is laced on the back; the feather on the saddle of a cock is purely distinctive of the male, and finds no counterpart on the cushion of the female. Practice bears out the theory, and in breeding for cocks, mossiness in the hens mated up never troubles me, nor do I find the top-colour in the young cockerels bred from such is discoloured because of the faulty cushion. Cocks bad in top-colour are the outcome of sooty, brassy, or smoky neck hackles of the female, together with the already faulty saddle of the sire.

"To breed good cockerels, I therefore choose (1) A standard cock of the heavy laced stamp. (2) He must be free from white in tail. (3) A hen with a well-laced breast on the light side, perfect wings, with a good black tail. But (4) do not regard mossiness on cushion; in fact, she is better for being dark near tail. (5) Comb, legs, shape, to be standard quality in each. Thus many a champion show cock has been bred from birds, none of which would gain a first prize in a second-rate show.

"Pullet-breeding is a question I should prefer to have been treated by an abler pen than mine. That the art is not theoretically or surely discovered, is apparent from the fact that nearly every year the best pullets come from different yards, and from those, too, whose record for first-class birds has not been eminent. Breeding is a trifle flukey with most breeds, but that of Silver-laced pullets is uncommonly so. With a certain amount of diffidence, then, I simply offer the fruits of my own experience. It was just now remarked that standard-breasted cocks mated with standard-breasted hens are inclined to throw light-breasted pullets, and I wish now to emphasise that remark. In choosing a pullet-breeding cock I always select a dark-breasted cock, and that from a pullet-breeding strain. It is no use buying a cock for breeding pullets from a strain that has been used for years in producing exhibition cocks only, because the females in such a yard will most probably never have seen a show pen. Again, breeders always try to obtain the clean lacing of show pullets right into the tail. To produce such we must not regard too closely the exhibition points of the sire, and I would have no scruple in using a cock that had white in tail, and for choice would prefer one, especially if there were under the cock's saddle a number of clear laced pullet-feathers running into the white in tail. But whilst unorthodox in these points, I like to be very particular as to fluff. A dark fluff is always correct, both for show and breeding purposes. A light fluff and peppery thighs largely account for double lacing, horse-shoe lacing, dulness in black, and other evils amongst the progeny.

"There is only one thing to be considered in the female we breed from to produce pullets. That is, to get as perfect a show bird as you can.

"Two practical hints may be added. Don't cross strains too much, unless you find that through continual in-breeding you are getting weak, and require more stamina in your stock. Then introduce new blood in the female line. And always have a few *old* birds in the breeding-pen. Young stuff breed bad feathers, lanky chickens, and narrow, long backs."*

American practice among some breeders is changing rather in the direction of more preference for single mating; and some of them differ a little from the above in one or two details. In many American cocks, the wing-coverts or bar-feathers, instead of being laced entirely round, with the open centres, resembling other laced feathers but somewhat heavily laced, are black over the upper half of the feather, and only open in the centre on the lower half. The effect on the surface-pattern or "bars" is the same; but such an extra portion of black on the part of the feather which is overlapped, must somewhat alter the balance of colour in breeding. It may be partly owing to this fact, that many American breeders find it distinctly better to use every now and then a bird with light instead of dark under-colour or fluff, and we believe the same has occasionally been done in England also, with advantage in clearing the centres. In all such cases, particular care is taken to have the lacing itself rich and black; when that is secured, we are given to understand that a cross with such light fluff has several times been known to have evident result in clearing out mossy feather.

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* Capital object-lessons in what is required for cockerel and pullet-breeding pens of Laced Wyandottes will be found in two coloured plates published by *The Feathered World*, London, in November 1908 and 1909.

Another point relates to the hackles and saddle-feathers of the cocks. Many American breeders have come to the conclusion that the laced character of Wyandotte plumage should (in due measure) extend to these male feathers also, consequently in the latest standard it is stated that the shaft of the feather "is white," so as to permit of the breeding of more open-laced birds (Fig. 108); and in the broad part of the saddle-feathers they seek for what they call a tapering "diamond," or open centre of a diamond shape (Fig. 109), which in a photograph we reproduce measured about three-quarters of an inch long by a third of an inch wide. This is probably the American method of defining what our English contributor has described above as "clear laced pullet-feathers" under the cock's saddle in a pullet-breeder, and so far the two rules would run on parallel lines. The only real difference—if, indeed, it be any difference—is that American breeders define the marking as just stated, and systematically select stock possessing it; and give as their experience that, by breeding from standard cocks with these hackles and saddle-feathers, and a little judgment as to balance in lacings generally, they can breed both sexes good from a single pen.

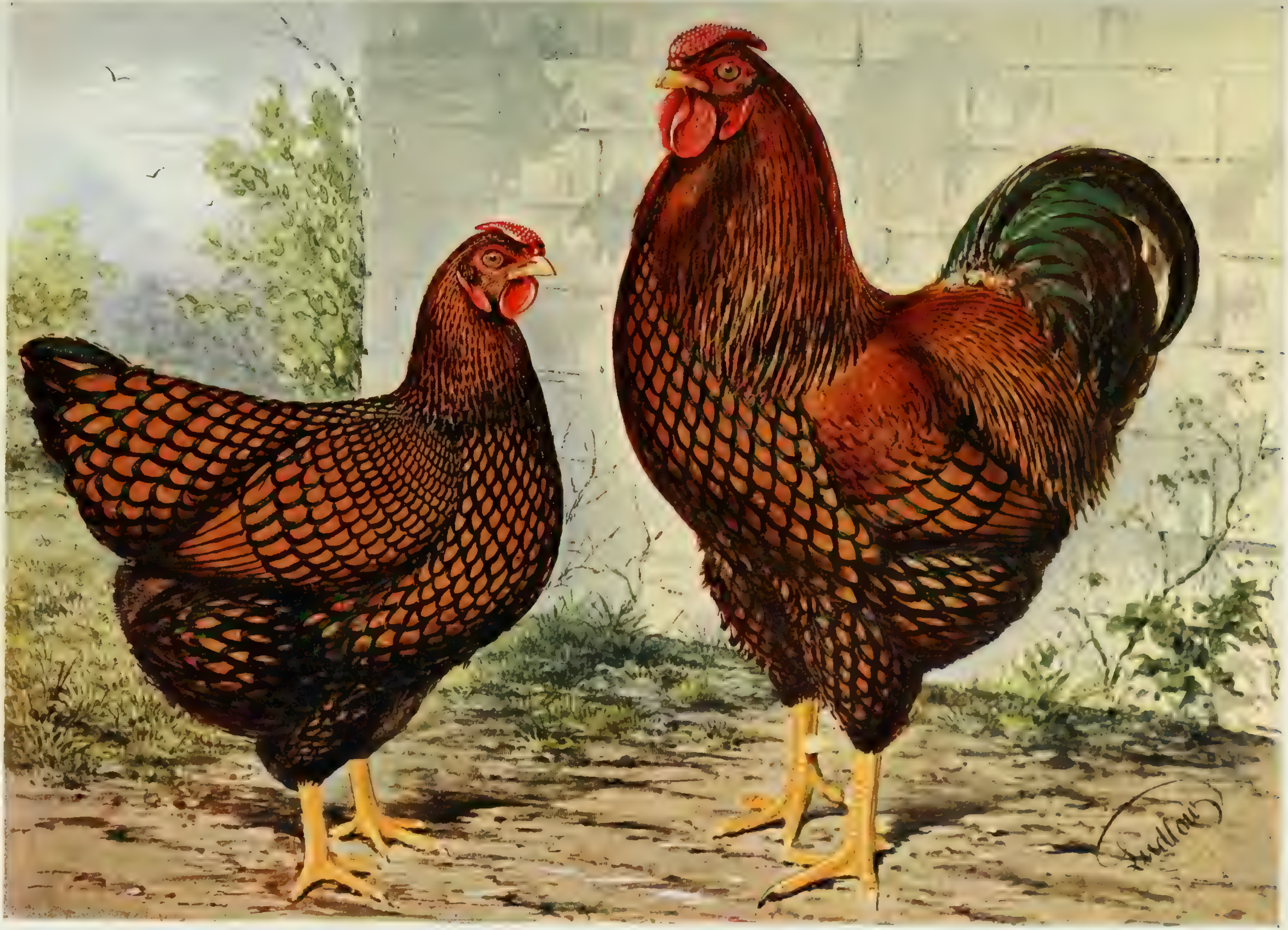
Golden Wyandottes.

The Golden Wyandotte was at least several years later in date than the Silver, but all we are now able to ascertain is that Golds were written about as "new" in the American journals of 1885, and that in the winter of 1888 Mr. Sid Conger came unmistakably to the front with them, and that after this date they were largely bred by crossing his Gold cocks upon the Silver hens of other breeders. The first imported into England were sent to Mr. A. W. Geffcken, and others soon followed, those early importations being considered fully equal, if not superior, to the then average of Silvers in Wyandotte type, and especially in comb. But there is not the least doubt that both comb and general type, subsequently to that, suffered considerably in this country from crossing with Indian Game, of which the signs were at one time very evident in many exhibits. Some used this cross for enriching the ground-colour, which became too dark in consequence; others, we believe, resorted to it with the idea of getting depth of colour in the lacing. At all events, we have seen many pullets which, in their sloping backs, narrowness at stern, and narrowness and hardness of feather, betrayed the cross most unmistakably; and in pullets as late as 1899 we actually found *double lacing*—not that above described, of a light edge outside the black line, but the double *black* lacing seen in many Indian Game pullets. We knew one breeder, in fact, who bred and exhibited pullets from a cross of Indian Game upon Silver Wyandottes. The faults thus introduced, however, have now practically disappeared.

On the Golden Wyandotte Mr. Cromblehólme wrote as follows:—

"The only point in which these differ from the Silver is that of colour. For faults and good points in the lacing, reference may be made to what has been said above on the laced feather of the Silver Wyandotte, and it is only necessary here to treat of colour. Those who have drawn up the standard are responsible for the description of the ground-colour as rich golden bay. I am glad to see the word 'golden' in addition to the 'rich bay,' and also the reference to 'brightness' of colour; for the term 'rich bay' has for a long time been misinterpreted for a dark shade of bay, *too* dark to please the eye. In *The Wyandotte Annual* for 1898 I called attention to this fact, noticing that the dark heavy-breasted winner seemed to be falling into disfavour with many, for a bird of a brighter and more real golden colour. This move of popular taste is in the right direction; for the laced Wyandotte being a fowl whose beauty lies in symmetry of markings and contrast of colour, the effect is destroyed when the background is so dark and sombre that the lacings are rendered comparatively undiscernible. Judging such birds is quite a task, comparable to assorting flowers by star-light. The brighter shade alluded to does not, of course, include the clay-coloured breasts sometimes seen, nor top-colour in the cocks like lacquered brass, any more than the deep gold means red or maroon colour.

"I used to like to see the deep rich gold on the back of a cock, and do so yet in breeders, for in the breeding yard it is better to have too much colouring pigment than too little, the tendency in breeding being rather to lose colour than to gain. But, in show birds, I have come to the opinion that the 'bright' gold cock is the one that catches the judge's eye, and is also the



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GOLDEN WYANDOTTES.

choicer sample from the artistic point of view. Let it be understood that this refers to colour taken by itself, and other things being equal; and it is not to be supposed that a bright bird with faulty lacing is to be preferred to a dark well-laced one. Colour is only one of the points, and the judge who goes for one point to the exclusion of others of equal importance, is termed a faddist.

"In mating up the breeding pen, all the remarks made above on the Silvers in regard to lacing, should be followed in the Golds. As to colour, there is however a little difference. White is white always, and we cannot choose degrees in it for breeding; but in breeding Golds, it is better to err a little on the dark side. I have always noticed that pullets are inclined to be lighter in ground colour than their parents; so in the pullet-breeding pen one should go for plenty of ground-colour. The cockerels, on the other hand, come better and brighter from parents of the correct standard shade."

Buff Laced and Blue Laced.

From the same fountain-head of the original Black-Laced Wyandottes, have proceeded yet two other varieties of singular beauty, known as Buff Laced and Blue Laced, or Violettes, which are closely allied, and in the main of the same parentage. The Buff Laced resembles in colour the variety formerly known as Chamois Polish, the ground-colour being some shade of rich buff, laced with white instead of black; the Blue Laced has a similar ground-colour, with a lacing of blue-dun or Andalusian colour.

Both these varieties originated in America, Mr. Ira C. Keller appearing to have been first in the field. He commenced in 1886 to cross Golden Wyandottes with Whites, producing birds whose lacing was violet-blue; these violet-laced birds threw a certain number with white lacing, and from these were derived his Buff Laced breed, first shown at New York in 1895, and some of which were sent over to the Rev. John Crombleholme, in 1897. Mr. Keller aimed at a golden or golden-buff ground-colour.

Quite another strain was originated by Mr. Brackenbury, from entirely different materials. He mated a Golden cock with a hen of *solid* blue or Andalusian colour, produced from two generations of Golds on the male side, and of blue on the female side. She produced a pair of Golds with blue lacing, of which the female died, and the male was bred to Golden females, producing again blue-laced Golds. Meantime Mr. Brackenbury had got from a cockerel bred from Golden Wyandotte and Buff Cochin, and pullets bred from White Wyandotte and Buff Cochins, a "sport" with Buff Laced plumage; and this bird was mated with some of the blue-laced females above mentioned. The cockerels from this mating all came black-laced; the pullets partly blue-laced and partly white-laced. One of the best *blue*-laced pullets was mated to a blue-laced male, and three-quarters of her chickens came creamy white with buff heads, and ultimately moulted out Buff Laced. The same bright-blue-laced pullet was afterwards bred to a Buff Laced (*i.e.* a white-laced) bird, and all of her pullets and three-fourths of the cockerels came white in the lacing, or of the Buff Laced variety.

Other American breeders, like Mr. Charles Pond, have also originated Buff Laced Wyandottes by crossing Golden with White, Violettes always appearing in the process. Probably from these crosses of unallied blood, all breeders, without exception, have reported them as remarkable for hardiness and great laying powers, ranking with the Whites in that respect.

The Rev. J. Crombleholme's notes on these varieties were as follows:—

"Opinions differ, but in mine the Buff Laced Wyandotte is the prettiest of all the varieties. What should be the colour and what should be the markings of a Buff Lace? For a perfect hen, imagine a real rich buff with every feather laced all round with pure white lacings; and a perfectly coloured buff cock, with white lacings and stripes, would be a standard Buff Laced cock. Or put it another way, comparing the Buff Laces and Golds. Wherever the Gold is bay, the Buff Laced is buff, and wherever the Gold has black lacing, or striping, or fluff, the Buff Lace is, or should be, white. You simply substitute buff for bay, and white for black.

"In breeding Buff Laces, the great difficulty is to steer clear of the blue and black feathers, which continually appear where the feather should be pure white. They were probably made originally from Golds and Whites crossed. Whilst judging a show in Holland, I came across a cockerel and a pullet which the owner declared to be a cross between a Gold and a White. They were very fair specimens of Buff Laces, without a trace of black about them, but I fear if the owner breeds again from these birds the old Gold blood will reassert itself, and many blue and black feathers will be found in hackle and tail. I know some English breeders also who have made this cross, with a certain amount of success, but Buff Laces require time and skill to breed. One thing is certain, that in their composition no alien blood has been introduced. They are Wyandottes, made from Wyandottes. We never find single combs in the chickens, nor do we ever hatch chicks with feathered legs. Much advance has already been made in their breeding, and although as yet not the fowl for the million, some of the very best breeders have been working at them. Probably we have almost bid adieu to the black-tailed cocks which have been seen, and which looked so extremely mongrelised in the show pen, that if it had not been for the graceful beauty of the female, I do not think they ever would have 'taken.' She was always attractive, and far ahead of the male bird from the beginning. But even the hen was at first too red in ground-colour, and showed a dirty blue-black hackle. The new century has inaugurated better quality; the red is changing to buff, and the nondescript blue-black dirty hackle to one composed of a clean blend of buff and white.

"Little can be added in regard to the breeding of lacing in these birds, for the theory was exhausted on the subject of Silvers, and the colour directions closely follow in principle those on Golds. Just as the breeder would disqualify from the breeding pen any white feathers in Golds, so he must be as severe in discountenancing black feathers in Buff Laces.

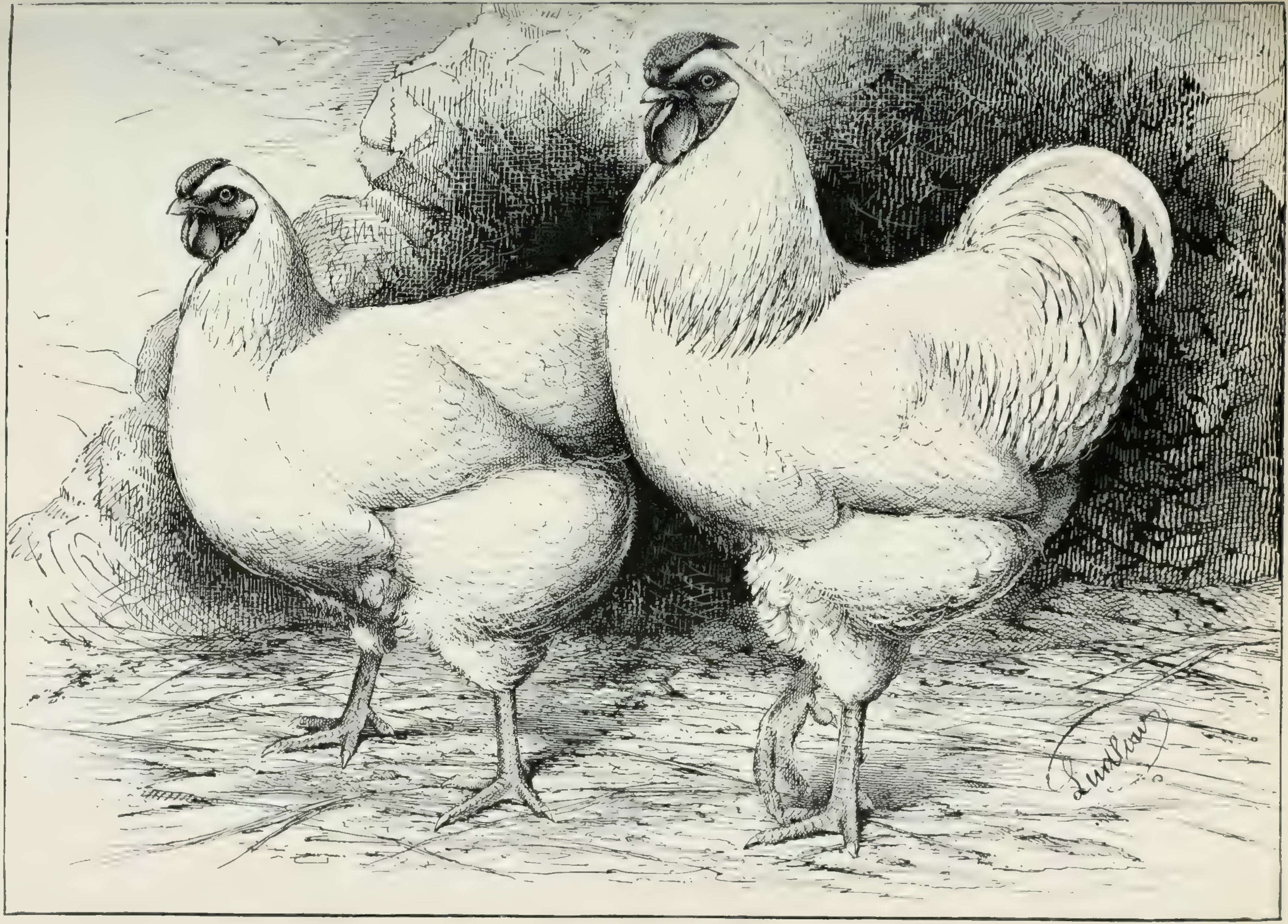
"Some writers have quarrelled with the nomenclature and the name of Buff Laced; they say a buff-laced fowl is a fowl with *buff* lacing, whereas the one in question is a white-laced buff. Can anyone point out, however, a fowl whose name conveys an accurate description of its marking? If there is any attempt at description, we invariably find that the first word of the compound designates the ground-colour, the second its qualification. For example, silver-spangled Hamburg, silver ground-colour, with spangling; and so also the gold-spangled Hamburg, silver-pencilled Hamburg, silver-laced Wyandotte, gold-laced Wyandotte, and logically the buff-laced Wyandotte. In no case is the colour of the spangle, pencil, or lacing, expressed. Why therefore should we be compelled to describe our Buff Laces in any other way? It is a euphonious name, a pretty name for a pretty fowl.

"Breeders must face the difficulty of getting the pure white lacing round the buff feather. It will be a most arduous task, and will I doubt not cause as much trouble as the mossy feather in Silvers and Golds. Whilst in the incipient stages, when dark hackles in pullets were tolerated, the white lacing was fairly distinct; but now that we insist upon a true buff ground-colour, and true hackles, the lacing has appeared to be less distinct. Perfection cannot be attained at a leap, and there is little doubt that in time we shall get what we are trying for—a true buff feather with a pure white lacing.

"About the same time that Buff Laces were introduced, there appeared the Violettes. They may be described as a Buff Wyandotte with an Andalusian blue lacing, or as the same as the Gold Wyandottes, but substituting the blue lacing and fluff for the black. I consider them to be sports from the Buff Lace, or perhaps they appeared in the breeder's yard who was trying to make the Buff Lace from a Gold cross. This surmise seems the more probable from the fact that the American breeder who was responsible for the introduction of Violettes and Buff Laces was also noted for his Golden Wyandottes, and I believe kept no others. It was from this breeder that I first purchased my own Buff Laces, and they repeatedly threw Violettes amongst their progeny, till I got rid of the strain altogether, and started afresh after my own ideas of producing a good Buff Lace. The original American Buff Laces I gave to a farmer, and he has bred from them some Violette pullets as well laced as any I have seen in the show pen. So much for the relationship of the two varieties. The Violette is a nice Wyandotte, but to my fancy is not 'distinct' enough, as florists say of flowers, to become very popular or to catch the eye."

Blue-laced Wyandottes are now recognised in the Standard. In breeding them, it will clear up some of the points mentioned in the above, to recognise fully and clearly the *relationship* of the blue lacing. As already stated in Chapter XIX., whenever we cross black or very dark plumage with white, we always get a certain proportion of blue, either of one shade, or in the form of cuckoo barring, along with a certain proportion of the original white or black. Where the black is mixed with colour, as in a Golden laced fowl, or a black-breasted Red, the opposites appear to contend with each other specially, leaving the coloured part of the feather more or less unaffected; so that we get a Pile in Game, or a white-laced bird instead of a black-laced one. Thus the blue lacing simply means that we have in it a bird with the black and white tendencies mingled, or balanced. In this way the blue marking is often most plastic in a breeder's hands, as shown in the brief account of Mr. Brackenbury's proceedings given above. It is always *half way to white*, and if this be remembered, the course will often be clear, and it may be most valuable material.

The greatest difficulty in breeding both these varieties arises from the combination of buff with white in the feather. We have seen already, in one buff breed after another, how all experience has taught Buff breeders to avoid any trace of white in the feather. The only way to meet the difficulty appears to be the selection of the most



WHITE WYANDOTTES.

solid and rich buff possible, or else a rich gold or bay. The most beautiful Chamois Polish we ever saw were a deep rich gold, of a shade which not only increased the beauty of the lacing, but would probably be easier to breed free from blurred lacing or from "meal."

White Wyandottes.

Of the White Wyandotte, the last really pure or uncrossed descendant of the original Wyandotte race—for it was undoubtedly a sport from the Silver—the Rev. J. Crombleholme wrote as follows:—

"If I desired to keep Wyandottes for utility purposes only, I should select the White. The White, as a rule, is the plumpest Wyandotte grown, for, as there are no markings to breed for, but purity of white only, one need not fear to regularly introduce new blood in the yard. As a consequence, the enervation of constitution that follows too much in-breeding does not exist, and strong progeny is ensured. Another consequence of this freedom of choice is that the Whites are the best layers. Sweeping assertions of this nature are, perhaps, open to contradiction; at all events, my own best-shaped Wyandottes are the Whites; they are also my best layers, and produce the most fertile eggs.

"In breeding Whites we must insist on purity of colour. It is no use trying to get good chickens from sappy parents. There is something in a 'sappy' feather which no one that I know of has been able to diagnose, and which is always perpetuated in young stock. Anyone, then, anxious to breed exhibition chickens must insist on a true white colour in the parents. No matter how big or how fine a cock or hen looks, if they are yellowish or discoloured, keep them out of the breeding pen. When I first began breeding White Wyandottes I wrote to a noted breeder of White Leghorns, and asked him how he managed to show such extremely *white* birds, hinting that if there was anything in it he might let me know. His answer was, that his was a *white strain*. I took it then that he did not wish to tell me his secrets, and let the matter drop; but now, after eight years of breeding, I have come to the conclusion that this White breeder was not joking, but telling a straightforward tale."

As supplementing these remarks, we quote a description of "Standard Requirements"[*] in White Wyandottes from the pen of the Club's Hon. Secretary, Mr. J. Stephen Hicks:—

"Utilitarians should remember that a perfect shaped bird, according to the standard, is necessarily a useful type, because good shape indicates good table properties, and, in this particular case, also winter-laying qualities.

"Taking a cockerel first, and beginning with his head, the beak is bright yellow, the colour of the comb, face, wattles, and lobes bright red, showing no traces of white; the comb itself is of course rose, or double, having a fairly long and tapering spike or leader, which must follow the curve of the head and neck. What is termed the 'work' in the comb is really short, fine sprigs or spikes, which should be regular and not coarse. The whole appearance of the comb must be neat and symmetrical, broadest at the front or base, and gradually narrowing. A plain, neat comb is preferable to an overweening, lop-sided affair full of coarse 'work.'

"The neck hackles should be flowing and fairly full, without being twisted or bunched; the shoulders are required broad and level; the wings straight and carried at a medium height when folded to the body; the whole back outline should be one graceful, regular curve, resembling the letter U with its sides pulled outwards. The tail itself is very important; it must be full and well spread, but carried by no means high, and should help to give a cobbiness so desirable to the general impression of a white Wyandotte male. The tail should not protrude much beyond the body, and, indeed, if the true tail feathers and the fluff about the stern almost form the same line, the effect will not be far wrong. The body itself must be deep and broad, and if that extremely difficult point, a full 'front,' or deep, rounded breast be obtained, so much the better. Many otherwise shapely males fall away in the chest, leaving a hollow when viewed sideways. The thighs should be of medium length, and be strong and thick, giving an impression of good size without a trace of lankiness, gawkiness, or the other extreme of dumpiness.

"Shanks and feet are required to be stout, with well-spread toes, and of as bright a yellow colour as possible, without a red tinge or any signs of feathering. A good cockerel will have them set well apart, as this is a sure sign of vitality.

"Purity of colour is of course required in both sexes, but there is so much that might be written on the subject that I will content myself by saying that the whiter a bird is the better, and so much the more valuable for breeding purposes.

"The texture of the feathers is neither very hard nor very soft—something a good deal looser than that of a Game bird, but not going to the fluffiness of a Cochin.

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[*] *The Feathered World*, No. 1119.

"So much for the male bird. Regarding hens or pullets, there are of course many features, such as comb, legs, colour, etc., which, allowing for the differences of sex, are just the same as in the cocks. Shape is perhaps the only thing that requires an additional word or two of explanation. There should be no straight lines in the outline of a good pullet; she should be, as I once heard a Yankee fancier say, 'A succession of curves.' Faults to be especially guarded against in the shape of females are hollow backs, squirrel or too long tails, lack of depth, and harshness of general outline.

"From the spot where the neck hackles meet the shoulders to the tip of the tail there should be one gradual, gentle slope upwards, and the tail itself should just protrude, short and wedge-shaped, from the cushion feathers. The cushion itself need be only just perceptible, not by any means like that of a black Orpington; but still, if it be there, it lends an added effect to a pullet's appearance.

"Be careful not to breed from single-combed birds, weak-kneed or narrow-chested males, green-legged ones, or even those that have many green flecks on their shanks. Select a male always that is as near perfection as you can obtain, but search him well for his faults (and mind, these exist in every bird). When mating him, take care that his wives do not possess the same faults, for, believe me, the bad points will perpetuate themselves without any trouble; but this is not always the case, alas! with the good points.

"Finally, though double mating is absolutely unnecessary with white Wyandottes, and once you have a reliable strain good birds will crop up not infrequently, please do not imagine the variety is as easy to breed to perfection as shelling peas. Such is not the case, and there is plenty of scope yet for new breeders."

The Black Wyandotte.

Next to the White, among the self-coloured members of the Wyandotte family, the Black is the most popular. The reason is not far to seek, for the handsome contrast of red headpoints with rich orange beak and legs and bright beetle-green black plumage, makes a most attractive fowl. It is, moreover, well suited for its colour, docile disposition, and is a capital winter-layer to the poultry-keeper with limited accommodation and surroundings where the lighter plumage varieties would soon become dirty and unsightly.

Black Wyandottes have long been favourites in America, and curiously enough also in Holland; but it was not until 1906 and 1907, following on correspondence in *The Feathered World*, that a decided boom took place in them in this country, and with a powerful specialist club formed in its interests the Black Wyandotte has a bright future.

As to type, the Black should be a true Wyandotte so as to differentiate it as far as possible from a Black Rock, and in other points allowing for colour the remarks on the White hold good. The yellow legs and beak, combined with sound black plumage, are the chief difficulties to be surmounted. Some breeders adopt double-mating; but others equally successful breed from the one pen only, and in the best interests of the variety it is to be hoped that this latter system will be generally followed.

Buff Wyandottes.

Buff Wyandottes are avowedly cross-made birds, and were produced independently both in America and England. The first American birds were exhibited at Liverpool in 1893, but English strains were already in existence or being formed at that time. In America they were produced by crossing Silver Wyandottes both with Buff Cochins, and in some quarters with Rhode Island Reds, an American yellow-legged amalgam of Cochin and local stock, very similar to our own white-legged Lincolnshire Buff, now known as Buff Orpington. In England the Silver Wyandottes and Buff Cochin were chiefly employed. Owing to this further cross of the Cochin, Buff Wyandottes are rather apt to manifest more propensity to sitting than the other varieties; but in spite of this are remarkably good layers.

In regard to breeding the plumage, nothing need be added to what has been already stated in treating Buff Cochins, Rocks, and Orpingtons. As in the case of Rocks, the yellow shanks and beaks required, make the colour rather easier to breed than it is in Buff Orpingtons. The variety, as is natural, seems scarcely to hold its own in competition with Orpingtons and Buff Rocks.

Partridge Wyandottes.

Partridge Wyandottes should have the exact colour and pencilling of the Partridge Cochin, with the shape and comb and legs of the Wyandotte family. They are of comparatively recent origin, but have become popular rapidly, and seem likely to remain so; the fact is that there is a natural fitness between certain breeds and certain colours, and the Partridge marking, or rather the colour which now passes

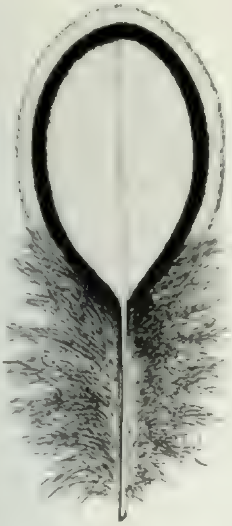


FIG. 100.
Double laced Feather.

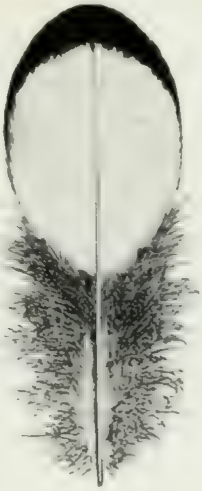


FIG. 101.
Spangled Feather.

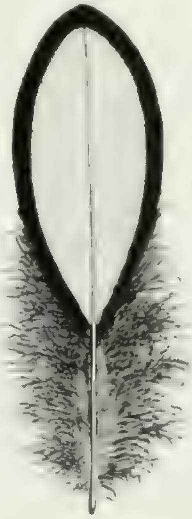


FIG. 102.
Almond Feather.

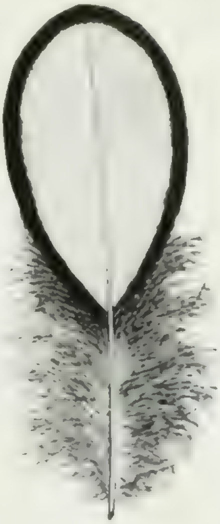


FIG. 103.
Open Feather

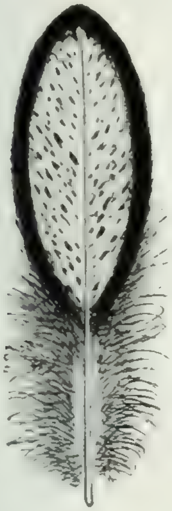


FIG. 104.
Mossy Feather.

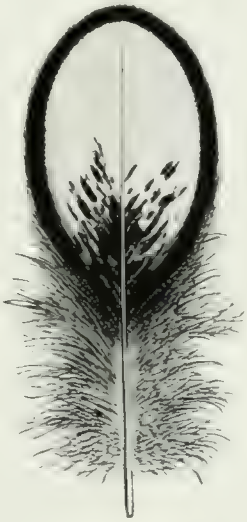


FIG. 105.
Ticked Feather.

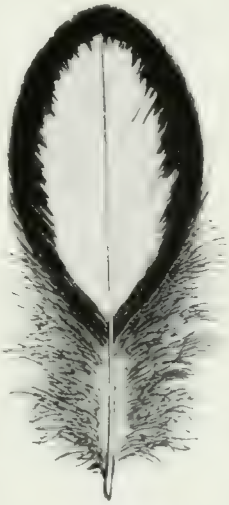


FIG. 106.
Irregular Lacing.

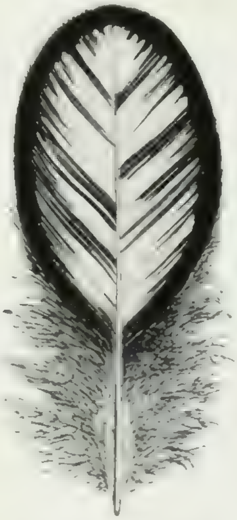


FIG. 107.
Streaky Feather.

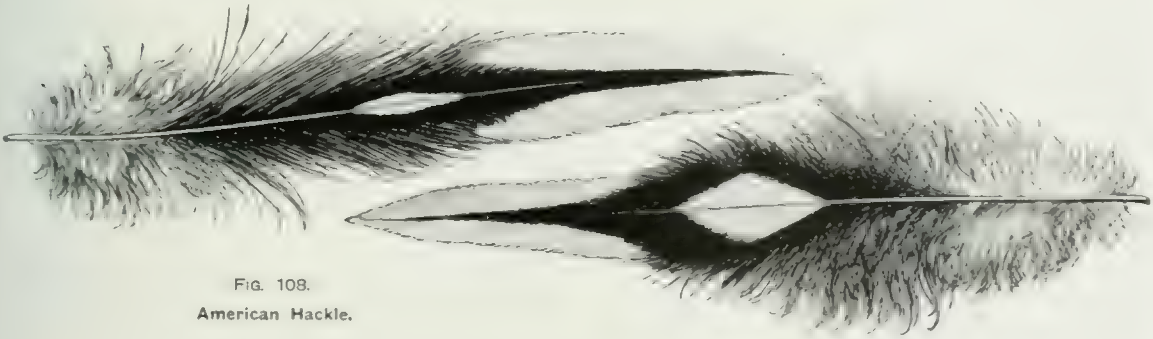


FIG. 108.
American Hackle.

FIG. 109.
American Saddle Feather.

WYANDOTTE FEATHERS.

by that name, appears to suit the neat and close-feathered Wyandotte type particularly well. The following notes upon this variety are contributed by Mr. John Wharton, of Honeycott Farm, Hawes, who was the first to introduce it into this country :—

"It was, I believe, in the year 1894 that I noticed in an American poultry journal a letter by the late Mr. McKeen, stating that he was working on the manufacture of Partridge Wyandottes, and this letter was immediately followed by one from Mr. Geo. H. Brackenbury, stating that he too had been engaged in breeding such a variety. These fanciers, it must be remembered, had been working quite unknown to each other, as their homes were some thousand miles apart. Mr. McKeen had the assistance of Mr. E. O. Theim, an able and careful breeder, whilst Mr. Brackenbury had an equally good helper in Mr. Cornell. On noticing the above letters, I wrote Mr. McKeen asking if he had any birds to spare. He replied that he would be pleased to fill me a small order in the autumn, when he thought he could send me a good start; but before autumn came Mr. McKeen was removed by death—a valuable worker in the fancy was gone. However, through the extreme kindness of Mr. Theim, we were able to procure a cock and two hens, and two cockerels with six pullets, and these reached us safely early in December, 1896. They immediately commenced laying, and from the very first sitting we hatched the well-known hen 'Pippin,' which has won forty-eight first prizes.

"I never asked how they were originated, but from what I have noticed in their breeding, I should say Partridge Cochin blood laid the foundation, whilst a judicious mixture of Golden Wyandotte and Indian Game made up the remainder.

"Of course the birds we imported were not perfect; in fact, they were far from that standard, which could be accounted for by more reasons than one. They were a new breed ; and no new breeds are expected to be perfection, or the charm would be lost in taking them up. But a greater reason than that made them look imperfect to British eyes, and that was their red or mahogany ground-colour, the idea of their originators being to get what we don't want, viz. a foxy or red ground-colour [see on American Partridge Cochins, page 256]. No one regrets this difference of opinion over the breed more than myself, as otherwise we could year by year have improved our yards by importation, and they would have reaped a good harvest of dollars. As it was, a second importation proved to us the folly of importing any more from America, as English judges considered them far too red in ground-colour and too dark in hackle.

"I ought here to mention that Mr. Pettipher, of Banbury, brought out a little later than our importations another strain, of his own home manufacture. In making this he strove, and with much success, to improve the ground-colour, and keep it of an English type. This strain was said to be produced by the careful blending of five different breeds.

"Many have an idea that the breeding of Partridge Wyandottes will be easy compared to Silvers and Golds. To such I say, 'Try.' I will give a little of my experience with the variety, which may help those that who taking them up to know how to breed, and what to breed for.

"First we will take the cock. The beak ought to be a bright yellow, though very few are yet to be found that possess this point. Next, the eye should be red, or at least bright bay: a pearl eye is a great objection, and very hereditary. The comb should be of that true Wyandotte shape, termed a 'cradle comb,' one that fits close to the head, and has the spike following the arch of the neck. Colour of head should be a rich orange, not red as we often see them. The hackle should be full, and fall well on to the back. The colour should be orange or golden-red, each feather having an intense black stripe down the centre, but not running up the full length of feather, or this will give the fault known as a smutty hackle, which is very objectionable. The breast should be a raven black right up to the throat ; no feather should be tipped with red, neither should there be any red visible even when the feathers are separated. The black should also continue over the thighs, between his legs, and right up to the root of tail ; a bird that shows light or grey behind is faulty. His back is required to be a rich red, but a bright red, not too dark a colour. The saddle hackle should harmonise with the neck, and be equally as well striped. The bar across wing should be as black as the breast, free from red tipping. The secondaries should be a rich bay on outer web, having a solid rich appearance when closed. The tail should be black right to the roots ; many birds have white in tail. Legs, as in all Wyandottes, are required a rich yellow all round, not red up the side or smutty in front, with toes well spread and free from any sign of 'duck foot.'

"To mate for the above we should require a male as near like it as possible. To him we would mate large hens or pullets, because without large females we cannot get large cockerels.

See that these females have good combs, and decent coloured legs, with plenty of bone, and, moreover, a good Wyandotte shape. The neck-hackle is perhaps the most important point; see that these possess a good stripe, with an equally good orange edge. As we do not require pencillings in cocks, we should not look for it in his mates, and, indeed, we consider females without pencilling more likely to breed good exhibition cockerels. The ground-colour must, however, be of the desired brown shade. With the above mating we should get exhibition cockerels, but the pullets would only be suitable for again mating up to produce cockerels in their turn.

"The pullet's beak, eye, comb, and leg colour should be exactly as in the male, but of course harmonising with her sex. The ground colour all over her body should be a rich light brown, not red, or it will be termed foxy; neither do we want it to err on the other side, or it will be termed grey or clayey. Each feather should be pencilled with a darker shade, the pencilling to follow the shape of the feather, as in the best Cochin hens. The pencilling should extend well up to the throat and right back to the tail, and with as much pencilling as possible on the thighs—in fact, pencilled all over except tail, which should be black, and hackle, which should be orange striped with black. Pullets with good yellow legs are few as yet, but breeders must strive for this important point.

"To produce exhibition pullets we require a different mating from that for cockerels. The females must be as near the exhibition type as possible, and the male required is one that has been 'pullet-bred.' He will generally be one with tipping on breast and thighs, but here lies a great danger. You must know for a certainty that he is 'pullet bred,' because faulty exhibition cockerels are sometimes sold as such, and such a male upsets all the mating.

"One thing which makes these birds valuable from an exhibition point of view is the fact that their exhibition career is not over in a couple of months, like many breeds. The pullets moult year by year sharper and more distinct in pencilling, whilst the cockerels have generally a brighter top colour after their first moult."

It will be observed that the breeding of this colour in Wyandottes is precisely the same as in Partridge Cochins, and reference may be made with advantage to the details of the breeding of those birds as described in Chapter XV. The close and tight plumage seems to suit this marking especially well, and many think Partridges the most attractive of all the Wyandotte colours.

Silver Pencilled and Columbian Wyandottes.

Later varieties to be added to the family of Wyandottes are the Silver Pencilled and Columbians, and these bear the same relation to Dark and Light Brahmas that the Partridges do to Partridge Cochins. The former were originated by Mr. George H. Brackenbury, the well-known American fancier and judge already mentioned in connection with Partridges, and were fashioned, as might be supposed, by mating the existing Partridge Wyandottes with selected Dark Brahmas, carefully selecting and "line-breeding" the produce. The first consignment received in England were two trios imported by Mr. Wharton in January, 1901. The three varieties are remarkable as presenting the beautiful Partridge and Brahma colours, with more moderate size, and freedom from leg-feather and fluff; thereby retaining the closer feather which the Brahma has now unfortunately lost, and with it the quality of heavy laying.

Both the name of Silver Pencilled, and contrast with the Partridge colour, have determined the choice of the whitest or paper-ground pencilling for these birds, and it must be bred in the same way as that type of Brahma. For details of this reference may be made to p. 272, and different pens will be required for breeding cockerels and pullets. To produce cockerels a bird must be chosen as good in show points as possible, and especially as clear as possible in white, as dense in the black, and with good striping in hackle. Want of clearness in white is the chief fault at the present stage. His hens must be of the same strain, and have solidly striped hackles and neat heads; their body colour may differ in various strains, but is generally rather dark: the blood is the main point. For pullet-breeding, on the other hand, we want hens or pullets with pencilling and show points as perfect as possible, and a cockerel of the same strain. He must have clear silvery and broadly striped hackles, and his breast will have either white ticks, or a laced edge at the tip of each feather, and on the fluff. If there be a narrow lacing of white in the tail or largest coverts, all the better. But again blood is the main thing, as a cock-breeding pen may also throw ticked or laced birds, which are, however, valueless for pullet-breeding. If the first year's breeding fails, breeding back to the sex the pen is selected for will usually succeed, if those birds are really good.

Columbians were first produced by breeding White Wyandottes to Barred Rocks, and the early birds were much wanting in striping of the hackles, and black in the inner webs of the wing feathers. This was gradually improved by care, and some breeders introduced Light Brahma blood, which of course remedied this fault a great deal, but brought occasional trouble with the leg-feather, and also too much fluff. The progress of the variety has been by no means rapid, and there is much yet to be accomplished before a perfect specimen is produced; but there is no doubt that better hens than cocks have been bred. The greatest improvement, within recent years, has been, perhaps, in hackle marking, both density of black and lacing being much better than formerly. Still, there are yet to be seen too many males showing canary-coloured tops, somewhat ugly combs, and fluff on legs. Hens, on the other hand, are of good type generally, and have much improved as regards hackle lacing, while body colour is good. With a little more density of black in hackle, and better lacing at the throat, the female would almost attain to ideal standard requirements; but this will take some time to accomplish.

In this case also the selection of colour and markings for breeding should follow the same lines already described in Light Brahmas (pp. 268-269). The main points are a really clear *white*, not cream, and distinctly striped hackles, not all black ones, which involve too often black ticks on what should be a white body. The proper balancing of colour has been described in the chapter referred to, and it is a good plan to mate with a cock hens showing a little more than less colour, until the way they breed is ascertained.

Other Varieties.

As regards the recently introduced varieties, the Blue, Red, White-laced Black, Pile, and Spangle may be mentioned. All are at present practically in an evolutionary stage, the more advanced being probably the blue and the pile. The former, which is the most popular, is as far as possible bred to one level colour, and several very creditable specimens have been seen at poultry shows. A few good piles, spangles and reds have also been penned at the classic exhibitions. It is impossible to say with any degree of certainty if all are likely to have a vogue, but the newly formed Variety Wyandotte Club should greatly assist in encouraging the breeding and exhibiting of these sub-varieties of the Wyandotte family. Cuckoo Wyandottes, of which a pair were exhibited at the Dairy Show of 1897, have not made the headway expected, possibly owing to their resemblance to Barred Rocks in plumage.

The Wyandotte is perhaps the most impressive modern example of the efficacy of that *line-breeding* fully explained on pp. 185-187 of this work. The "marked" varieties present plumage of considerable difficulty, obtained by amalgamating very heterogeneous materials and some of them have been produced within a very recent period; yet something like standard marking has been obtained in a surprisingly short space of time. Years ago so much progress in so short a time would have been impossible, as is proved by the history of the Silver Wyandotte, the first and progenitor of the family. We saw many yards of that variety, and the average produce of the great mass were to all appearance the merest mongrels, of all kinds of marking and peppering, from which only a few could be selected that were fair show specimens. That was the result of buying and crossing stock according to the ordinary method, which many fanciers pursue even yet; while some of those who adopted in-breeding, and thereby soon obtained better marking, by their want of system obtained less than they might have done, and in many cases lost size and shape and constitution. By employing the more systematic methods already referred to, the history of the more recent varieties has been a marked contrast to this. Breeders have known what to do, and by the *systematic* method of line-breeding have obtained equal results in a much shorter space of time, and upon the whole without any manifest physical deterioration.

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Short and broad. *Beak:* Short and well curved. *Eyes:* Of medium size. *Comb:* Rose, firmly and evenly set on the skull, low, square-fronted, and gradually tapering towards the back and terminating in a small but well-defined spike or leader, which should follow the curve of the neck and without any upward tendency, the top oval and covered with small and rounded points, the side outline of the comb being of convex shape, curving to conform to the shape of the skull. *Face:* Smooth, and of fine texture. *Ear-lobes:* Of oblong shape, well developed and smooth. *Wattles:* Of medium length and fine texture, and well rounded.

Neck.—Of medium length, and abundantly covered with hackle.

Body.—Short, deep, and round. *Breast:* Broad and round, with straight keel. *Back:* Broad and short. *Saddle:* Full and broad, and rising with a concave sweep to the tail. *Wings:* Of medium size and well folded. *Sides:* Well rounded. *Fluff:* Full and abundant.

Tail.—Well developed, spread at the base, the true tail feathers carried rather upright, the sickles of medium length.

Legs and Feet.—*Legs :* Of medium length, the thighs well covered with soft and webless feathers, the shanks strong, fine, and well rounded, and free of feather or fluff. *Toes :* Four on each foot, straight, and well spread.

Carriage.—Graceful and well balanced, resembling that of the Brahma.

Weight.—Buff Laced, 7½ lb. ; other varieties, 8½ lb.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—Buff Laced, 6½ lb. ; other varieties, 7 lb.

COLOUR

THE BLACK

Beak : Bright yellow. *Eyes :* Bright bay. *Comb, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Bright yellow.

Plumage.—Black, with a beetle-green sheen, the under-colour as dark (black) as possible.

THE BLUE-LACED

Head points, Legs and Feet : As in the Black.

Plumage of the Cock.—Bay ground with blue markings. *Hackles :* With distinct blue stripe down the centre of each feather, and free from black tips or black round the edging. *Back and Shoulders :* Free from black, or smutty blue. *Wings :* Bar, laced blue, and well defined. *Breast :* With well-defined lacing, free from double or outer, or black or smutty marking, and regular from the throat to the back of the thighs. *Fluff :* Blue powdered with gold. *Tail :* Solid blue, free from black or white.

Plumage of the Hen.—*Neck-hackle and Tail :* As in the cock. *Remainder of Plumage :* As on the cock's breast, the lacing to extend to the back of the thighs into the fluff.

THE BUFF

Head points, Legs and Feet : As in the Black.

Plumage.—Any shade of buff from lemon to dark, at the one extreme avoiding washiness and at the other a red tinge, the colour to be perfectly uniform, allowing for greater lustre on the hackle and saddle feathers, and the wing-bows in the case of the cock only.

THE BUFF LACED

Head points (except *Beak :* Yellow, or horn tipped with yellow), *Legs and Feet :* As in the Black.

Plumage of the Cock.—Rich buff with white markings. *Hackles :* With white stripe down the centre of each feather. *Breast and Thighs :* With clear and regular white lacing. *Wings :* Bars laced with pure white, and well defined ; secondaries white on the inner web, and rich buff laced and white on the outer web. *Tail, Fluff, and Under-colour :* Pure white.

Plumage of the Hen.—*Neck, Tail, and Fluff :* As in the cock. *Breast, Back, and Wings :* Rich buff with regular white lacing, and the lacing on the cushion may continue into the tail coverts.

THE COLUMBIAN

Head points (except *Beak :* yellow or horn). *Legs and Feet :* As in the Black.

Plumage of the Cock.—White, with black markings. *Neck-hackle :* With a distinct black stripe down the centre of each feather, but free from a black outer edging and black tips. *Wings :* Primaries black, or black edged with white ; secondaries, black on the inner edge and white on the outer. *Tail :* Glossy green-black, with the coverts either laced or not with white. *Remainder of Plumage :* Pearl white, entirely free from ticking, the under-colour being either slate, blue-white, or white.

Plumage of the Hen.—*Hackle :* Bright, intense black feathers, entirely surrounded with a silver white margin. *Wings, Tail, and Remainder of Plumage :* As in the cock.

THE GOLD LACED

Head points (except *Beak :* Horn, shading into or tipped with yellow), *Legs and Feet :* As in the Black.

Plumage of the Cock.—Rich golden bay with black markings. *Hackles :* With distinct black stripe down the centre of each feather, free from ticks, black outer edging, or black tips. *Back :* Free from black, or from deep maroon. *Breast and Underparts :* With well-defined jet black lacing, free from double or bay outer lacing, the markings regular from throat to back of thighs, showing green lustre. *Thighs and Fluff :* Black or dark slate, slightly powdered with gold, with clear lacing round hocks and outer side of thighs. *Shoulder Tip :* Laced with black. *Wings :* Bow, rich golden bay ; coverts, evenly laced, forming two (at least) well-defined bars ; secondaries, black on inner and wide golden stripe on outer web, the edge laced with black ; primaries, black on inner web, and broadly laced gold on outer edge. *Tail :* Black, with green lustre. (Note.—Brightness and uniformity of colour to be considered of more value than any particular shade.)

Plumage of the Hen.—*Hackle, Thighs, and Fluff :* As in the cock. *Breast, Back, and Wings :* As on the cock's breast, the secondaries and primaries as in the cock. *Tail :* Black, with a green lustre, the coverts black with a rich golden bay centre to each feather. (Note.—Brightness and equality of ground, and regularity of lacing throughout, to be of first importance.)

THE PARTRIDGE

Head points, Legs and Feet : As in the Gold Laced.

Plumage of the Cock.—*Hackles :* Orange or golden red, with paler shade at back, each feather having a glossy black stripe down centre. *Back and Shoulder :* Rich bright red, free from maroon or purple shade. *Wings :* Bars, solid black ; secondaries, rich bay on outer web, and black on inner web and end of feather, the rich bay alone showing when the wing is closed. *Breast :* Black, free from ticks. *Fluff :* Solid black. *Tail :* Including sickles and tail coverts, glossy metallic black.

Plumage of the Hen.—*Hackle :* Golden yellow, clearly pencilled. *Breast, Back, and Wings :* Light brown ground, free from red or yellow tinge, every feather distinctly and plentifully pencilled with a darker shade, the pencilling uniform throughout, and following the form of the feather ; a brick or yellow ground is objectionable. *Fluff :* Brown (free from yellow or red), slightly pencilled ; the more pencilling the better. *Tail :* True feathers black, shading to brown at top, which should be well pencilled.

THE SILVER LACED

Head points, Legs and Feet: As in the Gold Laced.

Plumage.—Except that the ground is silver-white (free from yellow or straw tinge), instead of rich golden bay, the Silver Laced is similar to the Gold Laced. (NOTE.—In the hen, regularity of lacing and quality of colour in all cases must count above any particular breadth of lacing.)

THE SILVER PENCILLED

Head points, Legs and Feet: As in the Gold Laced.

Plumage.—Except that the ground is silver-white in the cock and steel-grey in the hen, instead of red (of various shades), the Silver Pencilled is similar to the Partridge.

THE WHITE

Head points, Legs and Feet: As in the Black.

Plumage.—Pure white, free from yellow or straw tinge.

SCALE OF POINTS

THE BLACK

Colour: surface, 20; under, 15	35
Type	20
Head: comb, 10; other points, 5	15
Size	12
Legs	10
Condition	8
	100

THE BLUE LACED

COCK

Breast	20
Head: comb, 8; lobes and wattles, 8; other points, 3	19
Back and wings	13
Tail	13
Size and condition	12
Fluff	10
Neck	8
Legs	5
	100

HEN

Breast	25
Back	12
Size and condition	12
Head: lobes and wattles, 5; other points, 5	10
Wings	10
Fluff	10
Tail	8
Neck	8
Legs	5
	100

THE BUFF

Colour	30
Head: comb, 8; ear-lobes and wattles, 8; other points, 5	21
Size and condition	14
Back	6
Legs	6
Breast	5
Wings	5
Tail	5
Neck	4
Fluff	4
	100

THE BUFF LACED

COCK

Breast and thighs	20
Tail	15
Head: ear-lobes and wattles, 6; other points, 8	14
Neck and saddle	13
Back and wings	12
Size and condition	11
Fluff and under-colour	10
Legs	5
	100

HEN

Breast	20
Back	15
Tail	15
Head: ear-lobes and wattles, 6; other points, 8	14
Size and condition	11
Wings	10
Fluff	10
Legs	5
	100

THE COLUMBIAN

Body colour	25
Hackle	24
Size and condition	15
Head: comb, 5; ear-lobes and wattles, 4; other points, 3	12
Type	10
Legs	5
Tail	5
Wing carriage	4
	100

THE GOLD OR SILVER LACED

Head: comb, 8; ear-lobes and wattles, 6; other points, 5	19
Breast	14
Back	14
Size and condition	14
Wings	12
Neck	8
Tail	7
Fluff	6
Legs	6
	100

THE PARTRIDGE

COCK

Head: comb, 8; ear-lobes and wattles, 6: other points, 5	19
Size and condition	14
Neck	12
Back	12
Breast	10
Wings	10

Fluff	8
Legs	8
Tail	7
	100

HEN

Head: comb, 6; ear-lobes and wattles, 6; other points, 5	17
Size and condition	14
Breast	13
Back	13
Wings	13
Neck	8
Legs	8
Tail	7
Fluff	7
	100

THE SILVER PENCILLED

COCK

Head: comb, 8; ear-lobes and wattles, 6; other points, 4	18
Size and condition	13
Neck	11
Breast	11
Back	11
Wings	11
Fluff	10
Legs	8
Tail	7
	100

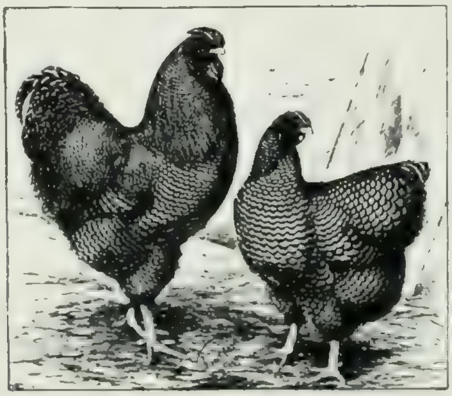
HEN

Breast	16
Size and condition	14
Back and wings	13
Hackle	10
Cushion	10
Legs	10
Type	10
Head: ear-lobes and wattles, 4; other points, 4	8
Tail	5
Fluff	4
	100

THE WHITE

Head: comb, 8; ear-lobes and wattles, 8; other points, 6	22
Size and condition	20
Body	12
Neck	10
Back	10
Wings	10
Tail	8
Legs	8
	100

Serious defects : Any feathers on shanks or toes; permanent white or yellow in ear-lobe, covering more than one-third of its surface; comb other than rose, or falling over on one side, or so large as to obstruct the sight; wry tail; deformed beak; crooked back; shanks other than yellow (except in adult cocks and hens, which may shade to light straw); feathers other than white in Whites; white in tail, or any conspicuous spotting or peppering on ground of the feathers, in Silver and Gold Laced, black in tail, or any excess of blue or grey in lacing, of Buff Laced; white in tail of Blue-Laced.



Cuckoo Wyandottes.

CHAPTER XXI.

MALAYS, ASEEL, AND INDIAN GAME.

THE fowls treated in this chapter, though the relationship is probably not very recent, are obviously more or less allied, and represent variations of another Asiatic race as typical as the Cochin, and which in the branch which first comes before us is also distinguished by its gigantic size. It is perhaps most probable on the whole that the Aseel represents the more ancient as well as the most pure original stock; in which case the Malay would owe its origin to crosses of that stock upon common local poultry of various kinds, gaining thereby in size, and losing somewhat in definite type, very much as the Malay is found to exist in actual fact. But there is strong ground for another hypothesis. A large bird of this general type is the indigenous or common fowl of a large part of India, as well as of the peninsula whose name it bears, and is in fact to this day more diffused than any other through a very large part of Eastern Asia. Upon this ground Temminck believed it to be the domesticated descendant of some wild *Gallus giganteus* now lost, but more or less resembling it. This view has lately been overshadowed by the theory of Mr. Darwin that the *Gallus bankiva* is the origin of all races of poultry; but when we consider how general and widely spread is this Malay shape and type, and how constantly *merely* domestic races revert to more primitive types unless preserved with a sedulous care which Eastern peoples never give, except to the strains cherished for cock-fighting purposes, the view of the older naturalist will be seen to have more in its favour than is generally supposed. If it were true, then the Malay would be the more ancient stock of the breeds now to be treated of, and the Aseel the cultivated aristocrat of the family, developed out of it by generations of careful breeding for one special purpose.

In any case, the occurrence of two totally different races of poultry in the East, both distinguished by gigantic size, raises a rather interesting question in regard to poultry feeding. Fowls are never fed in India or China with the care given them in England or America, nor with any study of nitrogenous "ratios" or anything of that kind, yet there have come to us from thence several marked varieties of two distinct races, both gigantic in size. The only noticeable fact which appears upon inquiry into the subject, is that the ordinary food of these fowls in their own country is "paddy," or unhusked rice. We know of this grain when husked that it is the very poorest of food, unless supplemented by other elements: we actually give it to Bantams to keep them small. But we know in the West scarcely anything about the husk of this grain, and no analysis of either the husk or the whole grain has ever been made that we know of; such facts as those before us suggest that the analysis and food value of *unhusked* rice is a question which might repay investigation.

Characteristics of Malays.

Coming back to Malays, there is perhaps hardly any breed with characteristics so distinctive and well marked, which makes it the more surprising that some of the "all-round" judges should appear still unable to grasp them. The head of the cock is large, and particularly very broad, with heavy overhanging eyebrows, which give a cruel expression to the face by no means belied by the character of the bird. Besides this, some of the older writers describe the bird as "serpent-headed," and observation will confirm the singular aptness of the expression, quite different from the snaky head sometimes spoken of in Game. The beak is very stout and quite curved, almost hooked in fact. The face is smooth and skinny, with the throat rather bare, wattles and earlobes small, and the comb unique, neither single, nor rose, nor triple, but like half of a walnut covered with very small projections. This should be fairly small and set well forward; but if two small combs are bred together, it is significant that *pea-combs* are apt to result, showing clearly the relationship with both breeds treated of in the following sections. The neck is long, and hackle full there, but short and scanty below, which gives the entire neck somewhat the appearance of a pillar the same diameter all the way down, and rising almost abruptly out of the shoulders. The body is large round at the shoulders, which are very prominent and carried high, and tapers away towards the tail, the back being long, rather convex in outline, and slanting downwards: the tail is also carried low and drooping, so that the back of the neck, the back, and top feathers of the tail appear as three nearly similar curved lines meeting at nearly equal angles: these curves were first represented by us in 1872, and are so characteristic as to be now adopted in the standard, as given on p. 344. The tail is fairly long, but well whipped, or carried rather close together, and the sickles and coverts should be narrow, and tapering very gradually towards the points. Both thighs and shanks are very long, the wings fairly large, and the shoulders standing out prominently from the body even when they are closed. All the plumage is short, narrow, and hard, so much so that the breast of the cock is generally bare in the centre. This bare breast-bone is not caused by wear, and is so characteristic that when absent it is sometimes artificially produced by plucking; but when any such bare strip appears in a bird whose feathers on each side are too broad, any judge who passes it without penalty ought to feel humiliated. The plumage is also marked by great lustre when the birds are in good condition. The size is very large, especially in height, some cocks standing 28 to 30 inches in the pen; but the plumage is so scanty and close, that the body always appears rather small for its real size and weight. The comb and beetle-brows, the narrow and hard feathers, the height and length of limb, the prominent shoulders, and the "three curves," are the main points of a Malay, and so prominent that no judge can be excused for overlooking them.

The hen has the same prominent shoulders, the same type of head and neck, and the same general carriage, somewhat less pronounced. She has a peculiar habit of "playing" her tail about more than other breeds, and this point is rather valued as evidence of good blood.

In regard to colour, all varieties should have brilliant red faces and appendages, pearl, or yellow, or daw eyes, rich yellow shanks with large scales, and yellow beaks, or yellow and horn; or horn-colour is allowed with very dark plumage. The most common colour shown is a Black-breasted Red cock, with Red Wheaten or cinnamon-coloured hen, a combination which is natural, and breeds true from single mating. Pure Whites are perhaps next common, but less so than many years ago. Of late we have several times seen birds of more or less brown- or ginger-breasted type. Many years since we used to see really magnificent Piles, applying the adjective to both size and colour; but this variety seems rare now We have known it imported direct in the old days, but it is also easily bred from Whites and the Black-breasted Reds, and it is probable that really good Piles would again be popular at the present day.

Early History of Malays.

The Malay is mentioned so far back as in the first edition of Bonington Moubray upon *Domestic Poultry*, in 1815, and is there spoken of as practically synonymous with the Chittagong, which may have been correct at that time of loose statement and nomenclature; but we have already seen reason for believing that at a later period the Chittagong represented a more composite race, crossed more or less with Shanghae, and possibly with Dorking, and probably owing more of its Indian blood to the Aseel than the Malay, as shown by the pea-comb and less prominence, though still marked, of the brows. We preserve the following notes written for us in 1870 by the late Mr. Hewitt, as carrying the personal recollection of a well-known judge and fancier so far back as the year 1830.

> Taking a retrospect of the Malays, as they existed before poultry-shows were so common, it appears that the strong elastic feather, so hard and metallic, yet so scanty, and the extreme length of the thighbone—so unsightly, yet so all-important characteristics—owners of late years have attempted to soften down, simply to ensure a better-looking and more compact fowl on the table. We thus have lost, in a great measure, the lovely narrow, lustrous feather that once stamped this breed as standing far aloof from all others—a feature that in the Malays of the years 1830 to 1835 was almost universal, the breast-feathers of birds of about that date being so narrow and free from down as scarcely to cover the fowl's body; whilst the sickles and side coverts of the cock's tail never exceeded a half-inch in width, were of the brightest iridescent hue, but slightly curved, and tapered very gradually indeed to an extremely fine point. Though carrying with them first impressions of being so barely supplied as to quantity of plumage, such birds when adult never appeared chilled, but, on the contrary, as though encased in whalebone-like armour from the effects of the cold.
>
> Neither do we now see any close approach to the great weights customary to Malays of bygone days. In 1833 I possessed a flock of Red Pile Malays, bred from a pen of three birds purchased for me from on shipboard at Liverpool: the old cock was nearly eleven pounds weight and the best hen a little over nine pounds. With the enthusiasm of youth, I weighed them scores of times, hoping to make this couple twenty-one pounds, which, however, at their best they never did attain by two or three ounces. I think we may look in vain for birds of that weight in the present hour. For the amusement of friends, I frequently tested this cock by putting a piece of bread on a table twenty-eight inches in height and four inches from the edge, and yet he was so lengthy and stilty as to easily appropriate the much-coveted morsel without jumping. These fowls bred well, and tolerably true to feather; but among many chickens, I obtained two white pullets and a black-red cockerel, though for three years they bred exclusively Red Piles, the three "sports" just named all occurring

in one nest. Some few years back a pen of the same variety of Malays were successfully exhibited at several shows, by a member of the Council of the Birmingham Poultry Exhibition, under the name of "Rangoons"; they were identical with the breed I once had, and were much larger than our present Malays.

The fine size and character of those early Malays was due to the abundance of imported stock, which frequently came over in the East India Company's vessels, and to an extent that made the fowls then quite common in the neighbourhood of the London Docks. With the fancy for Cochins, this nearly ceased, and such a long-limbed breed specially suffered from in-breeding, as it was then carried on by most of those who practised it at all. Thus it came about that in 1872 we were compelled to write of the fowls then known as fully one-third less in height and weight than the figures given by Mr. Hewitt, and as appearing small in body rather than large. Judges also lost hold of their points; so that the breed was actually described in the Standard of that day as red-eyed, and we have seen at Birmingham a hen win second prize which was short in the leg, flat in the back, with a spread tail, and to crown all, a single comb! More on this head is stated in the notes below, but it may be added that it was in order to recover the lost size and constitution, that at that date we strongly advised crossing with the Indian Game of Cornwall, which was actually far larger and more vigorous than Malays were then, and with enough Malay character in all except height and comb to make such a cross quite legitimate. The advice was followed, and to this cross was largely due the temporary loss of type, for a few years, alluded to below; but it did recover size, and renewed much of the lost constitution, and there can be little doubt that during the interval until further importations took place, it saved Malays from extinction or something near it. Later on fresh stock was received, some from India and some from Australia, and stature as well as size was fully recovered. A magnificent cock shown by Mr. De Courcy Peele at the Palace show of 1900, had a poor comb, and was very unorthodox in colour (a sort of brown breast spangled with black), but in size and character was one of the most remarkable birds we have ever beheld during more than forty years.

The following notes on Malays are contributed by Mr. Edgar Branford, of Woodbridge, Suffolk, well known both as an exhibitor and specialist judge of this breed.

"It is with feelings of great pleasure that I furnish a few notes on Malays. First, because I regard it as an honour to be associated with Mr. Wright's well-known work; and secondly, because of a nearly lifelong attachment to a fine old breed. Pedigrees in poultry yards are no longer popular; but personally I must confess to preferring creatures about me that can speak of their ancestors without a blush. Many people abuse my fowls, but few question their individuality, and none deny their claim to long descent. Once seen they will never be taken for anything else. In the first issue of *The Illustrated Book of Poultry*, the Rev. A. G. Brooke told us of a gentleman who 'had no sympathy with Malays.' Probably the variety has as many detractors as of yore; but now as then it attracts a portion (shall we say the elect?), of fancy's followers, and now as then, when the fancy fever takes the Malayan form it is apt to prove a chronic ailment. The names of old-time votaries crowd upon me as I write: Brooke, Hawkins, Ridley, Hinton, Fairlie, Terdrey, Owen, Frayn, and Huxtable; and all I think still stick to the ship save those who have, alas! gone over to the great majority. The mushroom man, indeed, is perhaps unlikely to persevere with Malays, for their little idiosyncrasies often prove trying, such as the uncertain temper of the cocks—that of the hens is consistent enough, if none too amiable—the hang-dog appearance of the birds when a bit out of sorts, and the tendency of one's best cockerels to go off their pins just when one is counting upon cups and specials.

Changes in Malays.

"During the half-century or so which may be said to cover the modern fancy, this breed has had its ups and downs, now rejoicing in separate classes, and anon banished to the colder atmosphere of the 'Any other variety.' In quality also the birds, like their fortunes, have fluctuated, and a short *résumé* of these latter changes, so far as they come within my own knowledge, may perhaps be of interest. Early in the 'seventies our breed had not emerged from the shadow which fell upon it with the advent of the Cochin. Malays were in the hands of few breeders, and those few appear to have been compelled to resort to in-breeding, which resulted in loss of size, though shape and character were retained. Five years later the birds filled the pens better, but the growth was mainly in breadth, while a square Anglo-Saxon sort of look pervaded them, strongly suggestive of some shameful *mésalliance*. Then for a time came improvement, and in the early 'eighties were to be seen specimens with old-fashioned necks and thighs, and presenting quite the cut-up swashbuckler appearance so characteristic of the breed.

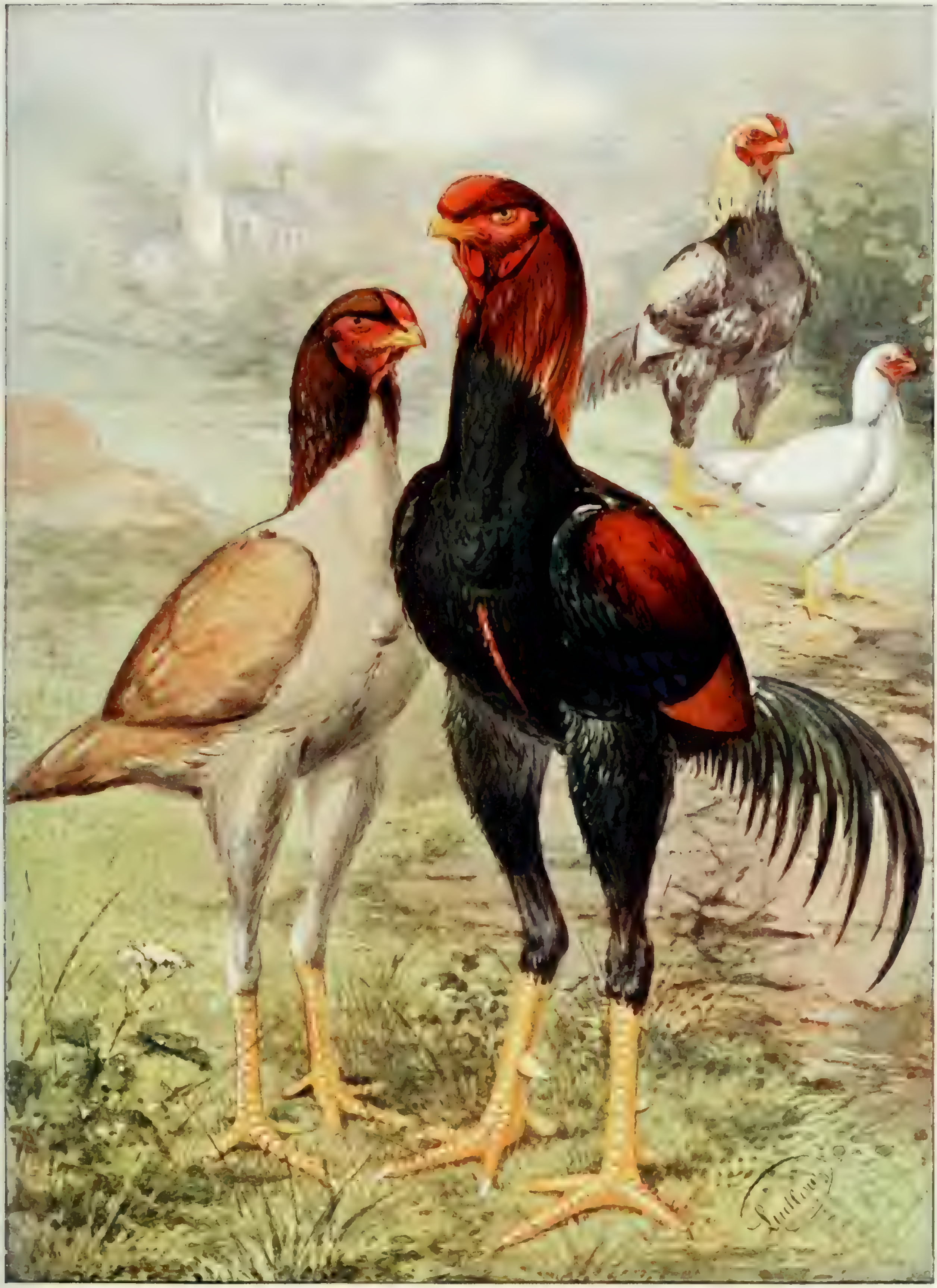
"Between 1883 and 1887 circumstances prevented my seeing Malays other than my own, and when at the latter date I again looked upon classes of the variety, it seemed to have reached the lowest ebb within my experience. The fowls were of fair size, but their good points, if they had any, were shrouded in feathers, their carriage approached the horizontal rather than the perpendicular, they mostly stood upon wretched feet, while the typical old-time heads were conspicuous by their absence. Indeed, at this period one old breeder told me he thought the beetle-brows gone past redemption. Happily, he was mistaken; and we have them back in great perfection, and not only them, but points which to my mind are of equal value, such as correct outline and carriage, broad shoulders, big bone, sound feet, great stature, with shortness and narrowness of feather; although in this latter particular we cannot yet rival our Australian cousins; witness the birds shown by Mr. Ravenhill at the Palace in 1893. 'Size in Malays,' very truly wrote Mr. Wright in 1874, 'should be greatly judged by height,' and I do not hesitate to affirm that the average length from beak to toenail of birds seen in the show-pen during the decade just brought to a close, exceeded by five inches that of those exhibited in the preceding twenty years. Truly gigantic were some of the chickens produced in the early 'nineties, and as good as they were big. About that time Mr. Brooke wrote me, 'I have just been looking at the best pullet I ever saw in my life.' Just lately, perhaps, there may have been a little falling off again in the quality of the youngsters, but the grand class of cocks and useful level lot of hens at the last Palace show, preclude any idea of deterioration.

"I have never recommended Malays for utility purposes, though nothing can beat a six months' pullet for the table. But to the true *fancier*, asking what breed he should take up, I would most certainly advocate their claims. Let such a one turn to the appended standard, noting the saliency of the features there described. The greatest tyro cannot fail to see *what* is wanted. Moreover, with few breeds will he find his desideratum so easy of attainment. Well-bred Malays will breed nearly as true to type as sparrows. The neophyte need not fear their 'reverting' to Cochin China or Cuckoo Dorking; and this fixity of type tends to help him in another way, inasmuch that in the show arena the scale is usually turned by size and bone, so that if he can only rear a *bigger* bird than more experienced competitors, a cup may grace his sideboard very early in his career.

Breeding Malays.

"A good breeding-pen may consist of a March hatched cockerel, measuring 38 inches and weighing about 10 lbs. He should stand upon sound feet and straight legs, and be good in points; for given health and vigour, the best show bird is the best for stock purposes, though the less he has been shown the better. If red Malays are the fancier's choice, the stag, whether of the old maroon or the bright red shade, should have a black breast and be quite free from white feathers. His mates should consist of from three to six adult hens measuring 33 inches, and weighing as much over 7½ lbs. as they can be obtained. In colour they may be any shade of cinnamon, wheaten, or partridge marked, but any signs of lacing or spangling should go far to disqualify. Minor faults in colouring, such as red feathers on breasts and fluff of cocks, or smutty ones similarly situated on cinnamon hens, are regarded by good judges with lenient eyes. Indeed the axiom that a good Malay cannot be a bad colour, appeals strongly to most real lovers of the variety. In choosing stock birds, every effort should be made to obtain them hard, short, and narrow in feather, otherwise their good points are completely hidden. Light eyes should also be insisted on. When Mr. Wright wrote in 1874, 'There never was a Malay with a red eye,' he and I were in agreement, but since that date the horrid thing has crept in, probably in this wise. Towards the end of the 'seventies Malays were undoubtedly crossed with their own illegitimate offspring, Indian or Cornish Game, with a view to regaining size. Now though the Indians have now, and indeed usually had then, pearl or daw eyes, owing to the potency of their Asiatic ancestors, yet their veins also contain the blood of the old red-eyed English fighting Game, and hence the occasional reversion in our favourites to those fiery optics.

"It should be noted that though I have advised the mating of a cockerel with hens, very good chickens may be reared from pullets running with an adult cock; still personally I find cockerels more reliable for breeding in the cold springs with which we have to contend in our eastern counties. It is also a fact that my own best youngsters have been the produce of three and four year old hens. It will be found that the age of the latter is not so important as might be thought. The question is, will they produce a quota of eggs sufficiently early in the season? and some will do so for several consecutive seasons, while others prove failures even from pullet-hood. In most cases the male and female birds should be procured from different sources, as at present our Malays are almost all more or less related.



ASEEL

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MALAYS

So far as I know it is some years since any importations from abroad have been made, and there is more danger to be apprehended from too close in-breeding than from too violent a cross. Useful typical Malays are to be purchased cheaply enough, but there has never been a time in my experience when a 'flier' would not command a bit of money. The best are of course the cheapest in the end, and in no breed within my knowledge is so little danger incurred in claiming high-class exhibition specimens, provided they have not been overshown ; still it may sometimes be within the power of a friendly breeder to give the beginner a cheap as well as a good start.

Management of Malays.

"With regard to housing and feeding, Malays will stand confinement fairly well, but under such conditions all varieties require special treatment, such treatment in fact as has already been advised and described in this work for fowls so situated. But those in the enjoyment of perfect liberty to roam over field and plantation are content with a simpler regimen. For roosting-place nothing beats a roomy shed, constructed if you please with ash poles and gorse faggots ; a few galvanised sheets on top of the gorse roof will render it absolutely watertight. If no danger is apprehended from foxes, or other thieves, a door can be dispensed with. The perches should be placed about 3 feet from the ground, and the floor should be well littered with brakes or fallen leaves, otherwise the feet of such heavy short-winged fowls are sure to suffer.

"The feeding of the stock birds gives little trouble. A small handful of sound wheat per bird early each morning, with nearly as much of the same grain as they will eat shortly before they go to roost, and of course access to clean water, will meet the case. Should the hens in early spring prove chary of their eggs, a hot breakfast composed of sharps and liverine, or an occasional ration of cooked meat, will usually bring them to a sense of their duties.

"With regard to selection, it is of course desirable to weed out the wasters as early as possible, but owing to the fixity of type before alluded to, this weeding is with very young Malay chickens not an easy task for a tyro ; so for a season or two he will do well to keep nearly all his youngsters until they attain the age of sixteen to eighteen weeks, when he will readily see which are likely to make the tallest and finest birds.

Hatching and Rearing.

"But we must hatch our chickens before we can count or cull them, and at once crops up the question, broody hens or incubators? Personally, after giving the latter a fair trial, I have returned to my allegiance to Dame Nature, though a machine always running throughout the season proves a capital receptacle for forsaken eggs or chickens. Malay hens are steady sitters, but it must be borne in mind that they require a very large amount of nest room, and must be kept free from all disturbing elements. They are also good mothers to their *own* children, but under no circumstances will they go in for baby-farming, so if coops are used they should be placed wide apart. My own broods are never cooped for more than forty-eight hours after hatching, each hen when set at liberty going her own way and minding her own business. The first food my baby Malays receive consists of Spratts' chicken meal, broken wheat, and a little canary seed. For the necessary animal addition to their diet I had for many years depended upon crissel, but last season resorted instead to freshly cut fresh bones, with very satisfactory results. As the birds grow older, if on a free run, plenty of sound grain with a small allowance of the crushed bone is all that the pullets will require to bring them to maturity. But the cockerels, from the time they are separated from their sisters (and the sooner this is done after their mothers desert them the better) require a more forcing treatment, if their ultimate destiny is to shine in the show pen. Mine get daily a liberal ration of ground bones, also a hot dinner consisting of equal parts of coarse sharps, Sussex ground oats, and liverine. I am also a great believer in the efficacy of a daily dose of Parrish's chemical food.

"From all specific diseases Malays seem wonderfully free, but the cockerels during their fifth, sixth, and seventh months are extremely liable to leg-weakness. As a remedy for this trouble, the pills recommended in the first issue of *The Illustrated Book of Poultry* [these will be found in the final chapter of this work] have in my experience proved almost infallible. This complaint must not be confounded with either cramp, gout, or rheumatism, in the first of which there is contraction of the toes, in the others heat and swelling of the parts affected. Leg-weakness is rather a form of nervous paralysis, a simple loss of power usually unaccompanied by any constitutional disturbance.

"The exhibitor of Malays starts with the great advantage, that no trimming is recognised or required in the preparation for the show-pen. Certainly I have seen birds plucked at breast, hock, and hackle, but seldom with beneficial results in the way of prize money. Chickens of course need a little training before making their first bow to the arbitrator, but when once they have learnt the business, they give little further trouble, save picking them off their runs and washing their legs and faces: their bold nature makes them capital showers. On their return from a show in the winter season, it is well to confine them for a couple of days in a cool airy room, and when put back on their runs care must be taken to prevent fighting. Malays require suitable baskets in which to travel, and the shape I like best is a long oval. For single cocks they may be 25 inches long, 25 inches high, by 13 inches wide, all inside measurements; for hens, same width, with a fourth taken off the other dimensions.

"One word in conclusion as to judging. The longer I live the more I am convinced that the fate and fortunes of a breed are mainly influenced by the way in which it is judged. During the years in which the Palace classes were taken by Mr. Chas. E. Waring, the quality and quantity of the birds advanced by leaps and bounds. We knew what he wanted, and what he wanted was the real Simon Pure. But alas! many 'all-round' judges like Mr. Brooke's friend before mentioned, 'have no sympathy with Malays.' I once asked dear old Mr. Dixon why he had not given a certain bird a card. He replied, 'Isn't he one of those beggars with hardly any feathers? I can't stand them.' At the Dairy show I have seen an unnoticed cockerel sold for £25. Not long ago at the Crystal Palace, I myself had a bird in similar cardless condition. I could not attend the show, but I think every Malay breeder who was there, either wired or wrote to me wishing to purchase, or congratulating me on having produced such a warm specimen. Three weeks later he was awarded Challenge Cup at the club show. Such instances might be multiplied almost indefinitely, and they play the mischief with a grand old variety."

Malays are better not hatched until May, or at least the very end of April, as the chickens feather very slowly during the first three months, and though hardy in a way, suffer from wet or cold winds. It is advisable to give them Parrish's Chemical Food towards the end of the fifth month, as a precaution against leg-weakness; should the cockerels after all be attacked by this complaint, to which all very long-limbed breeds are specially liable, recourse must be had to the pills mentioned above, which will be found in the final chapter of this work.

As a cross, the Malay possesses many of the good qualities of the Indian Game, imparting large wings and breast to other breeds in which these points are less developed, and also weight of solid meat; but the Indian Game has now almost superseded it for this purpose, giving the same advantages with less length of limb and less tendency to yellowness of skin and flesh. In the early days of the poultry-fancy some crosses with Spanish turned out remarkably well, producing a very glossy black fowl, known for a few years as the "Columbian," which was a good layer of large eggs: these birds died out, however, and any place they might have had is now taken, in all but size of eggs, by the Langshan and Black Orpington.

Judging Malays.

In judging Malays, special stress should always be laid upon the characteristic points as above indicated, which are so striking and obvious, that it is difficult to understand how some of them can be ignored as they seem still to be on some occasions. They are shortly defined as (1) Head and brow; (2) Height and limb; (3) Shoulders; (4) the "Three Curves"; and (5) Narrow feather. For marked deficiency in any of these, nothing can really compensate.

ASEEL.

As already stated, it cannot be determined now whether the Aseel should be regarded as the ancestor of the Malay type of fowl described in the foregoing section, perhaps through crosses upon larger common poultry of the country, or whether it has been developed from it by long and assiduous care in breeding. The relationship is very evident, as can be seen by the plate; and which is the aristocrat of the family, in either case, is no way doubtful. The Malay is tyrannical and quarrelsome, often even ferocious; but a good sharp-fighting English Game-cock will always make him turn tail, unless some chance happens to disable the smaller bird at the outset. The Aseel is of another character, and there can be little doubt that the birds whose battles are alluded to in *The Institutes* of Menu, 1000 B.C., if not the Aseel as now known, were at least their ancestors, and that the present race has been either maintained or gradually evolved, with express reference to combat, during a period of almost three thousand years. The following chapter will record cock-fighting as practised very widely in past ages amongst civilised races, to an extent that may come as a surprise to many; but in India it has from time immemorial been pursued with a universality and a passion that elsewhere had no parallel. The result of all this is mainly represented to-day by the Aseel.

Antiquity of Aseel.

The type varies somewhat, however, as we traverse the Indian Archipelago. In the first edition of *The Illustrated Book of Poultry* was given a reproduction of a coloured drawing by a native Chinese artist of the highest class of fighting Game-cock used in the Malay peninsula, Sumatra, and the neighbourhood. This bird presented the low carriage and much of the symmetry of the Aseel, but with more full and flowing plumage. Allowing for the different style of a native artist, the breed was evidently the same as figured in old American poultry-books of 1853, as the Sumatra Game, which had the same flowing tail and sweep of outline. The sickles of the Sumatra Game Fowl, carried low as they were, very nearly touched the ground, and the breed had a small and beautiful pea-comb. Other American importations were known as Javan Game and Malacca Game, all of which had very similar characteristics, but the Javan and Malaccan being larger in size. They all had a small pea-comb; and they are all reported as "dead game," beating the best English and Spanish Game then fought in the United States: one of these Eastern birds is recorded as having won no less than 75 battles against all comers.

Indian Cock-Fighting.

The retired Indian officer to whom we were indebted for the drawing above alluded to, part of a collection originally intended to illustrate a work on Indian fowls and cock-fighting, supplied some interesting particulars of Eastern methods of carrying on that sport, which differ totally in many ways from those formerly practised in England as described in the next chapter. He was stationed for years in the Straits, and told us that in some districts almost every native walking about would have a cock under his arm ready for any challenger. This was specially the case in Sumatra, and at a great ceremonial cock-fight sometimes a thousand spectators would assemble. The methods of fighting were briefly as follow:—

> Some birds live for years and win many matches, for generally one escapes altogether. Malay cock-fighting is really much less cruel than English; a few minutes and the longest fight is over. The spurs vary in outline, some being straight, some curved, and some waved; but all have edges as sharp as razors, and are in fact like blades of penknives fastened on. This makes the fighting so quick. It takes yards and yards of soft cotton thread, wrapped round and round in all sorts of ways, to keep the spurs firm *in loco;* and this is the first art of a Malay. The *golok* (a straight spur) is generally fastened under foot, close to the ground; the crooked spur in the natural position. They take a long time to heel the birds, and lots of people (friends) look at the position, and give their advice. All this time the money is collected on the mats—piles of dollars on either side—for they are very clannish, and if one side puts down a thousand dollars, the other must do so, or no fight; that is, unless a quarrel ensue, and they fight each other. Very few English engaged in the pursuit—I did not know above half a dozen that ever did; there was some danger of rows, and few liked to have to do with it, though nothing like so bad as an English cockpit. I *once* went into the pit at Westminster, and was so disgusted with a main, I never repeated my visit. I never saw a fight at Malacca; they fight there sometimes, but it is the purely native States that make such a business of it. The Rajah of Siak, the first cock-fighter of his day (1825-6), once sent a deputation to me of five boats full of officers, and about *thirty cocks*, with a pedigree to each bird: they were various colours and various names, and fine birds all. It was quite a grand ceremonial.
>
> Many of the birds are carefully trained. I have seen a man throw down a bird and hold out one finger two or three yards off, and the bird would fly at it and strike it! The birds know their owners, and they handle them most dexterously. They are generally put out of hand on the ground by the competitors at say eight or nine yards apart; but each man seeks to put his bird down at advantage, and there is manœuvring. The result depends much on training. Some run under and others fly high; it matters not how they meet, but meet they do, and strike home! They often meet high up in the air. I have seen—at different times, of course, and different birds—two cuts from Malay spurs, which, if they could have been done at once, and in one bird, would have quite cut the fowl in two pieces; one cut going clean through the back deep into the breast, and the other through the breast deep into the back—so keen are the edges of these deadly weapons, and so dreadful are the wounds. Generally one cock at once falls dead or next door to it, so that the other has only to give just one peck and rise, and it is over; but sometimes the dying bird lays hold of the unwounded one, and by a well-directed blow kills his assailant at once, and wins the battle. They are seldom touched after once let go, because, as I said, one is *hors de combat*.
>
> When the Bugis come to trade in the States the betting is very heavy; and sometimes when a man loses all he has he becomes desperate—in Malay language, "*meng-a-mok*" (Anglicè, "runs amuck"), and perhaps kills many. It is quite a royal affair when Bugis chiefs and Malay rajahs meet, and most intensely exciting, as they all have weapons ready for the least affront, and no man can offer another a greater insult than saying to him, "*Eteeh ber taji*" (*i.e.* "Duck-spurred")—the contrast is between *the duck* and, to their minds, the noblest of birds, a Game-cock! I have seen hundreds, and even thousands, of dollars lost and won on one fight of a few minutes' duration; and they go on most of the daylight after they once begin, about noon.

It is uncertain how long the true Aseel has been known in England. In 1871 Mr. Joseph Hinton, writing upon Malays, gave the following account of some other imported fowls which he had seen:—

> Last year I saw some birds brought from India by a friend. These birds he called *Game*, but in many respects they more resembled Malays. The cock's comb and gills appeared to have been cut; the shoulders were very prominent, and of extraordinary breadth for the size of the bird; the weight probably under six pounds, but the size and hardness of thighs something marvellous. The thickness of the neck was also

> another marked point; the hackle was scanty, and the tail drooping; whilst the general carriage was very Malay. The hens were even more Malay in character than the cocks, and their combs appeared warty. Of these birds my friend was remarkably proud. No strain could stand against them in fighting in India, and he had been offered fabulous sums for them. The hardness of these birds was something quite out of the common, and he tells me the same bird has fought four days following. The method of fighting there is a test of pluck and endurance, for they cut off the spur and bind tape over it, so that the battle is lengthened out; yet, he says, these birds would fight day after day for the time I have stated.

Aseel in England.

Mr. Hinton believed that these birds were probably a cross between English Game and Malays; but there can be little doubt now that they were Aseel, which were not known at that date. The details about fighting with muffled spurs are very interesting when compared with those above, by an authority who really understood Indian cock-fighting, respecting the sharp and deadly character of real combat. This latter was little test of endurance at all, but depended upon muscle and quickness; and upon that very account, as we have heard also from other sources, the muffled fighting, besides, was practised as *training*, in order to produce that hardness of muscle for which the Aseel is distinguished. For the modern introduction of the breed, however, fanciers are chiefly indebted to Mr. Charles F. Montresor, who both imported it and spread the knowledge of it to the best of his ability, by exhibiting, and offering classes, and in other ways.

The following notes upon Aseel are kindly contributed by Sir Claud Alexander, Bart., of Ballochmyle, Ayrshire, whose attachment to the breed has lasted many years.

"Aseel, as their name (which is an Indian adjective meaning "highborn" or "aristocratic") denotes, are perhaps the oldest breed of domestic poultry in existence, having been kept from time immemorial by princes, and indeed by all classes in India, for fighting. How well they have been selected and bred for this purpose, will soon be apparent to anyone who takes them up; for so inborn in them is the spirit of combativeness that even tiny chickens, before they have exchanged their down for feathers, will fight to the bitter end, while the introduction of a new hen into a pen always leads to many bloody heads, and often to more serious damage in the shape of broken beaks and blinded eyes. This, from the point of view of the English exhibitor, is their greatest drawback; for even when a goodly number of promising chickens have been hatched, no amount of care will prevent some of them from being ruined for the show-pen by their brothers and sisters. Added to this, although their plump breasts and freedom from offal make them excellent table birds, they are bad layers, and the hens cannot be depended on to lay more than eight or at most a dozen eggs each. Considering all this, it is, perhaps, not to be wondered at that many who have set themselves up with a stock of this variety, have given them up in despair, and been glad to exchange the mangled remnants of their carefully collected pen for a more peaceable breed. Even as I write, my two best pullets are dead, lying slain by a sister of the same hatch; yet oddly enough Aseel show little or no inclination to fight with other breeds, though in every individual of their own race they seem to see an hereditary foe.

"Their Indian originators have not confined their efforts to cultivating the mental characteristic of their birds, but have been equally careful to develop them physically to the best advantage, selecting always those hens to breed from which were best suited in appearance to produce fighting birds, while in the cocks, survival of the fittest has been secured by the simple process of fighting them incessantly. No one who has seen and handled a good Aseel can fail to admire the skill which has produced such enormous power in so small a compass; while offal has been reduced to a minimum, and dubbing rendered unnecessary; the tiny pea-comb giving no opportunity to an adversary, and the wattles being practically non-existent. For days before the battles come off, the natives will argue and wrangle as to the prospects of their respective favourites, and in many cases before the arrangements have reached completion, the owners instead of the birds have come to blows.

"I am told by friends who have watched these fights in India that the birds in common use are of all colours, as is the case with those seen at English shows. Through the kindness, however, of Colonel Hallen, who probably knows more about Aseel than any other Englishman, I obtained some birds whose parents he had imported from the most carefully kept collections of Indian princes, and these were all either black-red or bright ginger, while a few of the hens showed faint traces of the lacing to be seen in our so-called Indian Game, which have undoubtedly been manufactured from the more ancient Aseel. Colonel Hallen informed me that no other colours were admitted in the best strains, and indeed he once expressed to me his horror at receiving from a well-known and successful English exhibitor a spangled cock of the now fashionable colour, which he promptly returned. That he subsequently accepted a black-red cock from my own yard as a change of blood, may be taken as proof that the English show bird is in all, save colour, a worthy descendant of his warlike Indian ancestor.

"The Standard now embodied in that of the Poultry Club, was drawn up some years ago at the request of several admirers of the breed, by Mr. Charles F. Montresor, and those who wish to take up this interesting variety cannot do better than study it carefully. No remarks on Aseel would be complete without a reference to the great benefits also conferred on the breed in England by such careful breeders as Mr. James Hutchings, Major Dunning, Mr. Stawell Bryan, Mr. Peele, Mr. F. C. Tomkins, and Mr. E. Leake, all of whose names are household words in the annals of the show pen."

The Aseel resembles the Malay somewhat in the high and prominent shoulders, drooping tail, and short and narrow feather; but the shoulders are a little less angular, and the bird has much shorter and more powerful limbs, striking one as a little low in carriage of the body. The most marked characteristic of the race is weight compared with size: taking in hand an apparently small bird, it feels "like lead" compared with any other fowl, the Indian Game coming next to it in this respect. This arises from the extraordinary *density* of muscle which has been produced by generations of severe competitive selection, and we fear it must tend to decrease as the Aseel is bred year after year without that training and selection, as a mere fowl. Rigorously to discard any approach towards "softness" either of flesh or feather, is all that can be done to guard against this tendency.

INDIAN GAME.

This breed has been familiar in Devonshire and Cornwall for at least sixty years, but has only been practically known to any extent outside of those counties since about the year 1875, being at that date often spoken of or referred to as "Cornish" Game, in recognition of its local character. For years previous to that it often received and filled classes at the local shows, and in 1870 we found a large and good collection at the Plymouth show of that year. We had at that date never seen the true Aseel, and our idea was then that the breed had probably been produced by crossing Malays with English Game. Other various accounts have been given of its origin. The late Mr. Comyns leaned to the opinion that it sprang from Game and Malay "with a touch of Aseel and Indian Jungle Fowl"; and Mr. Tegetmeier also believed it to be mainly Malay. It was known as Cornish "Game," because on many occasions the fowl was actually fought by the Cornish miners, being in the early days—as we know from many sources—fierce and possessed of some courage. But even at its best it was never able to stand against good English Game, being too heavy and slow, and lacking spirit in comparison; and any fighting capacity which it ever did possess has now almost disappeared.

Origin of Indian Game.

There can, however, be no doubt at all now that the true ancestor of the Indian Game fowl is the Aseel, from which is derived the pea-comb, more moderated carriage and proportion, and more rounded form. The chief question really debatable has been, whether the Aseel had been crossed with Malay, or with the British race; and this is practically set at rest by the direct affirmation of Mr. Montresor. That gentleman published a statement in *Poultry* a few years ago, to the effect that in 1846 he had been personally informed by the late General Gilbert (afterwards Sir Walter Raleigh Gilbert) how he had himself originated the breed in Cornwall, years before that, by crossing red Aseel, which he had imported direct from India, with English black-breasted Red Game of Lord Derby's strain. Taking into consideration date, and social position, and locality, and detail, this statement must be held to settle that question in the main. But from inquiries we made in various directions respecting changes which we noted with our own eyes in the birds as exhibited, there can be little doubt that some further modification of the breed took place about 1870-77, crosses being made with birds intensely black in the cocks and magnificently glossed in both sexes, then exhibited occasionally as "Pheasant Malays." From this cross was derived a solid black breast and darker colour in the cocks, and greater richness of colour and more iridescence of the lacing in the hens; and we suspect the *double* lacing also, which we never remember to have seen before. What this "Pheasant Malay" itself really was, we are at the present date unable to say. It was certainly not Malay as otherwise shown; being smaller, with fuller tail, and with more symmetry and rounded shoulders, and it had a pea-comb. Neither was it Aseel as now shown; having too much tail, though of very narrow feathers, rather too much limb, and too upright or Malay a type of carriage. Our own impression, confirmed by every American fancier who has ever seen the breed in the United States, and whom we have been able to consult, is that these birds were probably specimens of the magnificent Sumatra Pheasant Game fowl, and that this breed has, therefore, been a third component of, and given the final "polish" to, the Indian Game. Its own close relationship to the Aseel has been hinted at in discussing that bird; and upon the whole the successive mixture of strains here indicated appears the most probable pedigree of the present Indian Game.

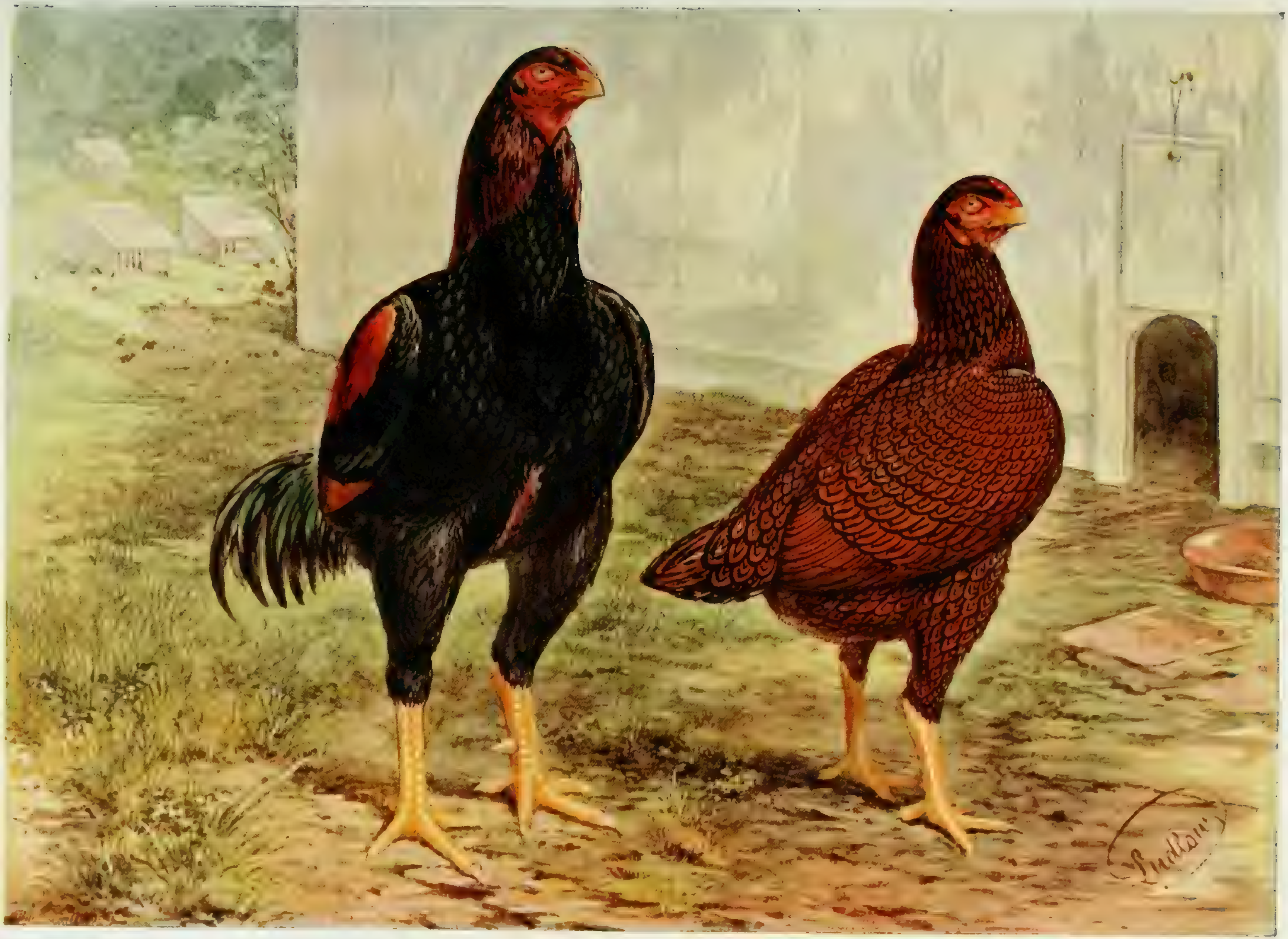
Characteristics of Indian Game.

The general appearance of the fowl is very much what might be expected from such an origin, but yet with a character of its own. The cock's head is rather broad and beetle-browed, but not nearly so much so as that of the Malay; and longer than the Malay, but not nearly so much so as the English Game. It is surmounted by a triple or pea-comb, which is apt to be rather large, and is very often dubbed. Wattles and ear-lobes are small and brilliant red, beak either yellow or horn-colour, or a mixture; eyes full and bold, and varying in colour from pale yellow to red, the latter colour evidently coming from the Derby Red cross, and being strong evidence of it. The neck is of medium length, and rather arched, with short hackles, but enough to just cover the base of the neck. The body should be very thick and compact, large and broad round the shoulders and tapering towards the tail, with a wide and deep but well-rounded breast, and tolerably flat back, with the shoulders standing out well and prominently, but not so as to cause a hollow back; neither must the bird be flat-sided. The wings are rather short, and carried close, with well-rounded points closely tucked in. The thighs and shanks are stout and only medium length, not nearly so long as in the Malay, the shanks being rich yellow or orange, the feet well spread and flat, with the back toe well down and almost flat on the ground. The tail is medium length, with narrow sickles and coverts, very hard, carried drooping. The whole carriage is very upright, with high shoulders and lower stern, the back sloping; altogether with much of the Malay character, but much tempered down and differently proportioned. The plumage is throughout short, hard, close, and extremely lustrous. The breast, under-parts, and tail are rich, glossy, green-black. The head is the same green-black, but the hackle lower down is mingled or streaked with rich bay or chestnut, as are the saddle hackles, the shafts of the feathers being deep crimson-brown. The wing-bows are a somewhat similar mingling of deep bay or chestnut with green-black; the wing-bar green-black of the most lustrous kind; the secondaries deep bay on the outer web, and black on the inner webs and ends of feathers, forming a chestnut triangular wing-bay.

The general characteristics of the hen are similar, allowing for sex, but her colour is different, and almost unique among the black-breasted Reds. Her head and upper hackles commence also as rich green, but lower down the centre of the feather becomes chestnut, with only a green border. The body generally is of a very rich bay or chestnut ground-colour, each feather laced or edged with beetle-green, with such iridescence as causes the lacing to look as if embossed or raised above the surface of the feather. At the throat and upper part of the breast this lacing is very often single, but lower down, as the feathers get larger, and on the back, and on the wing-bows, there should be a second or inner lacing. Fig. 110 is photographed from some feathers of a beautiful hen, sent for the purpose by the writer of the notes below, and show the type of this double-lacing admirably. The feathers on the wing-bows are generally amongst the best for marking, and the coverts or bars should especially be well and boldly laced. Sometimes a *third* black centre-mark may be found in the larger feathers, inside the second lacing, but this is not usual in England. In America, however, where the Indian Game has become very popular since 1890, many breeders try to cultivate a still further or "triple" lacing, and the American Standard, till a few years ago, actually stipulated for "two or more" lacings on each feather. This is the principal difference between American and English ideas concerning these fowls, for in England even double-lacing is by no means apparent upon all feathers, though acknowledged and held desirable. To lay stress upon yet further lacing, must not only inevitably lead to the mating-up of special pullet-breeding pens, but would probably destroy that grand and "embossed" character of the marking which is so great a beauty; and on both these grounds it is a matter for congratulation that the last edition of the American Standard has omitted the words "or more," leaving only double-lacing as its description of the hen's plumage.

Qualities of Indian Game.

This fowl has been very largely bred of late for the production of table poultry, having in unusual degree the property of imparting good breasts and wings to crosses of which it forms a component, and weight and juiciness of flesh when crossed with fowls whose flesh may be in comparison "short" and dry. Such



INDIAN GAME.

crosses, as we have already seen, are not always the best for all circumstances; but when an adequate price can be realised to repay for proper age and growth, make the very finest of table fowls. When crossed with the Dorking the produce is very often white both in flesh and skin, and not seldom in shank also; but this point is found to differ curiously in different strains, or rather perhaps in birds reared upon different soil, to which the Indian Game appears unusually susceptible. Both colour of leg and richness and lustre of plumage have appeared to us, as the result of many observations, closely connected with run upon rich pastures, such as those of Devon; and we have noticed repeatedly that when stock has been transplanted to drier soil and more scanty herbage, it was extremely difficult, if not impossible, to keep up that richness of appearance which gave no trouble at all on the rich grass of the West. In the United States this fowl is even more valuable for the table than in England, the yellow colour being there in special demand, and needing no tempering at all. The birds have hitherto been too valuable to be very much used as broiler chickens; but it has been found that the required 2 lbs. is often made by cockerels at seven weeks old, and this with more breast and wing in proportion than any other breed known there. Even in England, it is chiefly the excellence of Indian Game and its crosses that has so greatly broken down the former prejudice against yellow-skinned birds, which we are glad to learn is to a large extent lessening in the London markets. The size and weight differ enormously according to the management and feeding. Like the Malay and Aseel, it always weighs much more than it appears to do, but giants are not desired for the show pen. On an average, we should say that the standard weights of 8 lbs. for an adult cock and 6 lbs. for a hen were generally exceeded by about a pound each in practice; but these exhibition birds are usually brought up quite hardy, with but little feeding. When fed up we have actually known a cock to reach 12½ lbs., which must be nearly the extreme; but we are bound to say that such great size does not seem to suit the general appearance of the fowl.

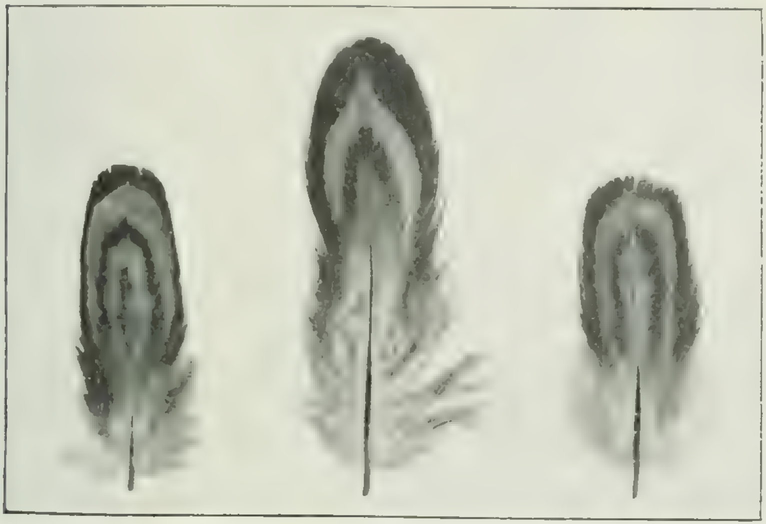

Under Throat. Back of Thigh. Wing.

Fig. 110.—Lacing of Indian Game Hen.

As a layer the Indian Game does not stand in the very first class, or in the same rank as those specially known as "laying breeds," but it is by no means a bad layer, comparing rather with breeds like the Dorking or ordinary fine farmyard poultry. Averaging various reports we have had, many strains are probably good for 100 to 120 eggs per annum. The eggs are from pale to dark brown, and particularly sound and smooth in shell as a rule, rather short or roundish, and of very rich flavour, at least upon the Cornish or Devonshire pastures. Pullets hatched at proper seasons are good winter layers.

The following notes upon Indian Game are kindly supplied by Mr. William Brent, of Clampit, Callington, well known as a judge, and as one of the oldest and most successful breeders:

Mr. W. Brent on Indian Game.

"This breed, which has become a very popular variety during the last two decades, and now has admirers in almost every part of the globe, was scarcely known outside of Cornwall and the fringe of Devonshire across the Tamar until somewhere about thirty years ago, but has been a leading variety in the Callington district for certainly more than half a century. The fowls were originally imported from India, and although the size of the breed has been increased, and the colour and markings have become more defined, they still retain in the main their original characteristics. In the earlier times the cocks were used in the 'pit,' and often 'won their spurs,' but although somewhat pugnacious still, they are not now nearly so quarrelsome as their ancestors. The writer has frequently seen from 30 to 60 cockerels, weighing from 7 to 10 lbs. each, living together in harmony, and scarcely ever a blow struck.

"These birds combine utility with beauty in a high degree, and have won their popularity from inherent worth, as very little in the past has been written about them. They are particularly hardy, and never do better than when allowed to roam in the fields, and sleep at night in the trees or bushes; but from their hardy constitution they also bear confinement well, and will lay well in winter if provided with sheltered runs. They breed true; and I have known as many as ten winners reared from one sitting of eggs. From some of the most carefully-bred strains, such a thing as a waster is practically unknown. Yet for beauty of plumage the Indian Game will compare with any of the fancy varieties of poultry. Each feather (especially of the females) possesses great beauty in itself. That of a pullet is a clear chestnut ground colour, with an outer and inner green-black metallic lacing of most exquisite lustre, which reaches the zenith of grandeur when the sunlight plays on the plumage. The general colour of the male is green glossy black, and the plumage is very close and hard, so that the bird looks as if he were wearing a coat of mail.

"For the table, Indian Game are unsurpassed, having a broad and deep breast from which many slices may be cut, and always in killing condition if moderately supplied with food. The somewhat yellow-tinted flesh (when ordinarily fed) has told against them in the London market; but this prejudice I hope is dying out, and whatever the flesh may lack in colour, is far more than compensated for by a very marked delicacy of flavour. At Plymouth, Exeter, and other western markets where they are better known, the Indian Game are eagerly bought, and command higher prices than any other breed of fowls; and this without cramming or any extra feeding whatever. They are also the best breed known for crossing with almost any variety for breeding table poultry, reproducing as they do to a very large extent their own characteristics on the cross-bred progeny, which is an evidence of their ancient pedigree.

"From my experience as a successful breeder and exhibitor for twenty-five years, I maintain that no class of poultry can be bred, reared, and successfully shown with less expenditure of time and attention than Indian Game. The first step, which is of paramount importance, is to possess healthy stock birds, of reliable blood. I allow the hens to sit on their own eggs in March, April, and May, and sometimes later, and when hatched I usually feed the chickens liberally twice a day (but oftentimes they provide for themselves), and the brood is healthy and grows rapidly. The hen will often guard her offspring until the cockerels outgrow their mother. If bred before March, the chickens require more attention, as there is then no insect life for them to feed on, and the cold winds play havoc with them, as for the first two months they are almost featherless. They get in full plumage when from five to six months old.

"The only preparation required for showing is to tame them by occasional handling; and to wash the legs (if dirty) and sponge the face before sending off to show."

Breeding Indian Game.

As indicated in the above notes, both cockerels and pullets of this breed can be bred from one pen, when the birds are of an old and reliable strain, and while the present standards of colour are preserved. Already, however, some breeders profess to get better results by mating up two pens, using hens with dark ground and heavy lacing to produce cockerels, and lighter ground and somewhat narrower lacing to breed their pullets. It will be a pity if this system spreads, or goes any further; and still more so if another system, which one or two breeders have pursued, of breeding pullets from red-hackled cocks, should extend. Hackles of this kind are a great fault in the male bird, and if tolerated merely to breed females, double-mating would be introduced in its worst form. Fortunately (from this point of view), while we know that some really fine pullets have been bred that way when the hens have been good, the bad ones have been in very large proportion, even more than when the usual system has been pursued. What can properly be done, and what (judging from analogy) ought to be effective in breeding well-marked pullets as well as rich cockerels, would be to choose males for breeding in which the chestnut or crimson in the back or saddle of the cock was sharp and well defined amongst the green-black, without being more in proportion or amount. It would be a great pity to go further, throwing away in any degree the benefit of the present acknowledged sex-colours, which have been proved to be natural and to breed true; and the greatest evil of encouraging triple or further lacing, as was once likely in America, is that it would certainly bring in ultimately the practice, if not the necessity, of using cocks with other than green-black breasts, merely for pullet-breeding. Independent of this reason, such changes would destroy that grand and bold character of the lacing which at present distinguishes and makes so beautiful the Indian Game.

It is better, so far as possible, to breed from birds over one year old, though this cannot always be done. The chickens are slow in feathering, though clothed sooner than Malays; and the progeny of adults fledge more quickly and kindly than those of young birds. The chickens are hardy to mere exposure, provided they are brought up so, but they *must* be kept running about, and there are none which suffer more surely from the falsely called "cramp" described on p. 85, if subjected to too much heat or to overfeeding. A prevailing diet of grain or hard food seems to suit them best, including especially a portion of canary seed if brought up in partial confinement: on free range, as indicated by Mr. Brent, they give hardly any trouble or anxiety at all.

There is really only one recognised breed of Indian Game, as described above. Whites have been shown as such, and appear recognised in America, but are mere mongrels, and were protested against by the Indian Game Club in 1900. A soft bird, with neither colour, nor marking, nor lustre, has no right to the name, and is not likely to preserve even the useful qualities for which the breed is valued, and which depend largely upon unbroken pedigree. Such birds would be disqualified by any competent judge recognised by the Club.

Blue Madras Game.

In a somewhat different category must be placed an undoubtedly pure breed of which very little is known now, but of which specimens were occasionally shown years ago under the name of Blue Madras Game. We have felt in some doubt whether they could most properly be mentioned under the heading of Aseel, or in this place. Their undoubted gameness would rank them with the Aseel, as would also their shorter legs and low carriage. But their large size, their much better laying than anything known of Aseel, the fact that they never sported white, while they sometimes did sport nearly black in the cockerels, and especially the *lacing* which distinguished them, seem to place them most properly here. At all events, while clearly not Aseel, they were undoubtedly a pure local variety of real "Indian Game," if not directly allied to the Cornish bird of that name, and had many qualities in common. For the following details we are indebted to Mr. R. Gordon, of Cheviot Cottage, Leven, N.B., and shall be pleased if they awaken some renewed interest in a variety which otherwise must soon become extinct.

"I fancy there are now very few specimens of this breed in this country, and doubt if more than one or two importations ever were made. Mr. R. R. Fowler imported some birds from India many years ago, and he stated that they were brought from the interior for over three hundred miles on camel-back. For myself, I kept the breed for three seasons, having obtained some stock from his original strain. Although very fond of them, I finally cleared them out, simply because I had not the space to do equal justice to them with other breeds I then had.

"Still, the breed was a good one. The birds were large, adult cocks weighing from 8½ lbs. to 9 lbs., and hens about 7 lbs. In colour they were something like the Andalusian, but with less grey slate, and more clear blue in their plumage, than the latter. They were also laced something after the Andalusian pattern, sharp and narrow round the margin of the feathers, and the colour of the lacing was dark blue. The hen was one uniform shade all over, hackle excepted, the latter being dark blue. Tails were solid colour, not laced. With regard to the cocks, breast and wing-bars were similar in colour and lacing to that of the hen's body, and the tail was also solid blue in colour like that of the hen. Neck hackles, back, shoulders, wing-bow, and saddle very dark blue, many specimens throwing a lot of red in neck and saddle. We never found any red feathers in the hen. Legs were dark slate; ear-lobes red The comb was a very neat, low-set pea-comb.

"This breed did not throw all blue chickens Perhaps twenty per cent. or thereabouts of the cockerels came pure black, and these generally grew into the finest of the flock so far as size was concerned. No whites ever appeared, and none of the pullets ever came other than blue. The shape of the birds was also very pleasing. They partook of something of the character of the Indian Game, but had hardly anything of the angularity of the latter. That is to say, they were fairly short and close in feather, broad built and cobby, short in leg (much shorter than Indian Game), stout in bone, nicely curved neck, which was also fairly short, and in harmony with length of leg, and wings carried well up, the butts showing clearly.

"I found that the best way to mate this breed was a rather dark cock with good lacing to clear blue hens, also showing good lacing. Many of the latter were of a beautiful dove colour, and well adapted for the breeding-pen.

"As to utility qualities, the hens proved fairly good layers of large-sized eggs, cream or buff-coloured in tint, but sometimes with a pinky shade. They were not persistent sitters during the warm weather, like many Asiatics, and moulted fairly early. The breed had also excellent table qualities. The skin was white, and the flesh both abundant and of fine grain and flavour.

"To many people, however, the breed had one bad fault. Both cocks and hens were incurably pugnacious. Many of the cock-chickens fought each other to the very death when about three months old. That is to say, they would scalp each other, knock an eye out with the beak, and so tear and mutilate each other about the head that if not quickly separated they frequently never recovered, but died in a day or two after their battles. The adults were as bad, every bit. I was greatly pestered by cock-fighters for specimens of the breed. (Pray, do not imagine there are no cock-fighters now; there are at least a couple of hundred in this county alone, to my certain knowledge.) One old fellow, well up in his sixties, who had followed the pastime all his life, told me that he recognised the breed from a pair which a Glasgow ship-captain had brought from India to a friend of his more than thirty years ago. The cock of this pair won several battles, and after breeding from him they 'cut him down,' to test the probable quality of his chickens. That is to say, they cut his spurs off, and matched him to a strong cock with naked heels (not armed with steel gaffs, however), to test his endurance and courage to the death. It took more than one strong bird to finish him, but he died without a flinch, with his face to the foe. It was and is a cruel proceeding, but it satisfies a cock-fighter whether a bird of a particular strain is 'dead game' or not.

"I have written in the past tense, but hope that some specimens of the breed may still exist in this country. At any rate, it is still possible to make them 'come again.'"

The following are the Standards of Perfection for the foregoing breeds, as adopted by both the Poultry Club and, in all but the exact form, by the specialist Clubs of the breeds concerned.

MALAYS (SITTERS)

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Very broad, with deep-set eyes and beetle or overhanging eyebrows, giving a cruel and morose expression. *Beak:* Short and strong, and well curved. The profile of the skull and beak approaches the shape of a segment of a circle. *Eyes:* Deep-set. *Comb:* Shaped like a half walnut, small, set well forward, and as free as possible from irregularities. *Face:* Smooth. *Ear-lobes and Wattles:* Small.

Neck.—Long and upright, thick through from back of skull to gullet, the bare skin of the throat running some way down the neck, hackle full at the base of the skull, elsewhere very short and scanty.

Body.—Very wide and square at shoulders, tapering to tail, the wing butts and shoulders prominent and carried well up, and usually bare of feathers at the point. *Back:* Short, very sloping, and of convex outline, the saddle narrow and drooping. *Breast:* Deep and full, generally bare of feathers at the breast-bone, and the chest inclined to flatness. *Wings:* Of medium length, large, and strong, carried high and closely to the sides; the feathers should be hard, short, and scanty. All the lines of the bird should present a hard, clean, cut-up appearance.

Tail.—Of moderate length, drooping, not whipped, the sickles narrow and only slightly curved, and the side-hangers rather full, also slightly curved and finishing to a point. The outline of the neck-hackle, back, and upper tail feathers should form a succession of curves at nearly equal angles.

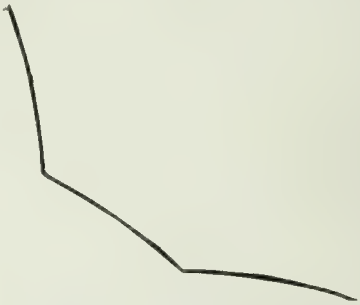


Fig. 111.—The Three Curves.

Legs and Feet.—*Legs:* Set well on the front of the body, long and muscular thighs, with very little feather on them, and leaving the hock perfectly exposed, shanks long and beautifully scaled, flat at hocks, and gradually rounding to setting on of spur, a downward curve in spur to be preferred. *Toes:* Four on each foot, long and straight and with powerful talons, the back toe lying close to the ground.

Carriage.—Very erect, high in front and drooping behind, standing straight at the hock, fierce and gaunt.

Weight.—11 lb.

Plumage.—Very close, scanty, narrow, and lustrous.

Handling.—Extremely firm and muscular.

HEN

Except that the *Tail* is rather short and square, neither whipped nor fanned, carried slightly above the horizontal line, and well played, as if flexible at the joint or insertion, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—9 lb.

COLOUR

Beak: Yellow or horn yellow preferred. *Eyes:* Pearl yellow or daw. *Comb, Face, Throat, Wattles, and Earlobes:* Brilliant red. *Legs and Feet:* Very rich yellow.

THE PILE

Plumage of the Cock.—*Hackle, Saddle, and Back:* Rich red. *Wings:* Bow, rich red; secondaries, bright bay; flights, white on inner web, with red outside edging. *Remainder of Plumage:* White.

Plumage of the Hen.—*Hackle:* Gold. *Breast:* Salmon. *Remainder of Plumage:* White.

THE RED

Plumage of the Cock.—*Hackle, Saddle, and Back:* Rich red. *Wings:* Bow, rich red; secondaries, bright bay; flights, black on inner web with red outside edging. *Remainder of Plumage:* Lustrous green-black.

Plumage of the Hen.—Any shade of cinnamon or wheaten, with preferably dark purple hackle. Partridge marked and Clay are also allowable. The Red variety should be quite free from white feathers in wings and tail.

THE SPANGLED

Plumage.—Somewhat similar to the Red in ground, except the *Breast, Under-part, Thighs, and Tail* of the cock, which should have an admixture of red and white. The hen's colour should be rich, and boldly marked with black and white. Each feather in both sexes should somewhat resemble tortoiseshell in the blending of its red or chestnut with black, and should have a bold white tip to it; even the long feathers of the wings and tail should be as tri-coloured as possible.

THE WHITE

Plumage.—Pure white, free from any yellow or black, or ruddy feathers.

Note.—The foregoing are the principal varieties, and others are not sufficiently numerous to warrant description. The above colours and markings are ideal, but in Malays not so much value is attached to these points as to type and quality.

SCALE OF POINTS

Head: skull, 5; brow and expression, 5; beak, 5; comb, 3	18
Shape (curves, etc.), strong shoulders and wing butts	15
Length of limb and neck, and stiltiness	15
Size and bone	9
Carriage and outline	9
Feather: short, narrow, and hard	8
Condition	8
Tail	5
Colour	5
Eyes	4
Feet	4
	100

Serious defects: Any clear evidence of an alien cross; diminutive size; single or pea comb; bow legs; knock knees; very bad feet; in short any defect that in the opinion of the judge is not sufficiently penalized by the deduction of the maximum number of points allowed in the above scale.

ASEEL (SITTERS)

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Short and small, though broad between the eyes and jaw, and thick at the base. *Beak:* Strong, thick, and somewhat short, upper mandible slightly curved, lower mandible straight. *Eyes:* Bold, set back in the head. *Comb:* Triple or "pea," the smaller the better, very hard fleshed. *Face:* Hard and of fine texture. *Ear-lobes:* As small as possible. *Wattles:* None.

Neck.—Of medium length, the same width throughout, powerful, and furnished with scanty feathering, with the throat clean, not prominent or fleshy.

Body.—Short; straight back; broad and high shoulders; stern narrow in comparison, but thick and strong in hand at the root of the tail, this latter being a great indication of strength. *Wings:* Strong, short, and level, carried well out from the shoulders.

Tail.—Short and slightly drooping, with the sickles tapering like a scimitar to within three or four inches of the ground.

Legs and Feet.—*Legs:* Thick and muscular thighs, well apart, and short shanks, free of feathers. *Toes:* Four, thick and straight; hind toe, if "duck-footed," not a disqualification.

Carriage.—Upright; not too "Gamey" in general appearance.

Handling.—Short, close, and wiry plumage, difficult to break, devoid of fluff; very heavy body in comparison with size; almost naked at point of breast-bone and first joint of the wings.

Weight.—6 lb.

HEN

The general characteristics are similar to those of the cock, allowing for the natural sexual differences.

Weight.—5 lb.

COLOUR

Except that the *Comb, Face, Jaws, and Throat* are red, there is no standard or fixed colour of *Beak, Eyes, Legs, and Plumage.* The principal varieties of the breed are the black, grey, red, black spangle, red spangle, white, and yellow.

SCALE OF POINTS

Head (want of skull)	20
Type	20
Condition	20
Legs and feet	10
Carriage of tail	10
Eyes and comb	5
Neck	5
Stern	5
Plumage	5
	100

Serious defects: Wry tail, or roach back, or any other deformity.

INDIAN GAME (SITTERS)

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Rather broad, long and deep, not so "keen" as in English Game, nor so thick as in Malays, yet slightly beetle-browed. *Beak :* Short and well curved, stout where it is set on the head, and giving the bird a powerful appearance. *Eyes :* Full and bold. *Comb :* Pea type, small, and fitting closely to the head. *Face :* Smooth and of fine texture. *Ear-lobes and Wattles :* Small. *Throat :* Bare, but not so much as in English Game, being dotted with small feathers. (NOTE.—It is customary to exhibit Indian Game cocks after being dubbed—*i.e.* having their comb, ear-lobes, and wattles removed, and leaving the head and lower jaw smooth and free from ridges.)

Neck. — Of medium length, fitted with short hackle, which just covers the base of it.

Body.—Broad and thickly set, short and flat back, prominent shoulder butts, fairly deep and well rounded breast. *Back :* Gradually tapering from shoulders to tail. *Wings :* Short and muscular, carried rather high in front, but well rounded at the point and closely tucked at the ends, and not flat-sided.

Tail.—Medium length, with short, narrow secondary sickles and coverts, close and hard, and with a slight droop.

Legs and Feet.—*Legs :* Very strong and thick, thighs round and stout, shanks of medium length, and set well apart. (NOTE.—The shank should not in any case be so long as that of the Malay, nor in any way stilty, but of sufficient length to give the bird a Game appearance.) *Toes :* Four on each foot, long, straight, and strong, well spread, with the hind toe set low, nearly flat on the ground, and extending backwards.

Carriage.—Very upright and vigorous, with sloping back.

Weight.—10 lb.

Plumage.—Narrow, short, hard, and close.

Handling.—Firm flesh, with plenty of muscle.

HEN

With the exception that the *Tail* is rather short, well venetianed but close, and hardly so low, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—8 lb.

COLOUR

Beak : Horn or yellow. *Eyes :* Varying from pale yellow to pale red. *Comb, Face, Wattles, and Ear-lobes :* Brilliant red. *Legs :* Rich yellow or orange.

Plumage of the Cock.—*Head, Neck, Breast, Under-fluff, Thighs, and Tail :* Black, with a rich green-black sheen, the base of the neck and tail hackles a little broken with bay or chestnut, which should be almost hidden by the body of the feathers. *Back :* Glossy green-black (or beetle green), touched on the fine fronds at the end of the feathers with bay or chestnut, which gives the desired sheen. *Shoulders :* Glossy green-black, slightly broken with bay or chestnut in the centre of the feather or shaft. *Wings :* Bows, similar to shoulders ; secondaries, glossy green-black on the inner web, and bay or chestnut on the outer web, a triangular patch of bay or chestnut alone showing when the wing is closed ; primaries, deep black, except for about 2½ inches of a narrow lacing on the outer web of a light chestnut. *Tail-coverts* (or furnishing) : Glossy green-black, slightly broken with bay or chestnut in the base of the shaft.

Plumage of the Hen.—The ground colour is chestnut brown, nut brown, or mahogany brown. *Head, Hackle, and Throat :* Glossy green-black, or beetle-green. The pointed *Hackle* that lies under the neck feathers is glossy green-black, with a bay or chestnut centre mark. The *Breast*, commencing on the lower part of the throat and expanding into double lacing on the swell of the breast, is of a rich bay or chestnut, inner or double lacing being most distinct, the *Under-parts* and *Thighs* being marked somewhat similarly, and running off into a mixture of indistinct markings under the vent and swell of the thighs. The feathers of the *Shoulders* and *Back* are somewhat smaller, enlarging towards the tail-coverts, and are similarly marked with the double lacing. The markings on the wingbows and shoulders running down to the waist are the most distinct of all, with the same kind of double lacing ; and often in the best specimens there is an additional mark enclosing the base of the shaft of the feather, and running to a point in the second or inner lacing. The *Tail-coverts* are seldom as distinctly marked, but with the same style of marking. The *Primary* or *Flight Feathers* are black, except on the inner frond or web, which are a little coloured or peppered with a light chestnut ; the secondaries are black on the inner web, while the outer web is in keeping with the general ground colour, and edged with a delicate lacing of glossy green-black. The *Wing-coverts*, which form the bar, are laced like those of the body, and often a little peppered. The lacing mentioned should be metallic glossy green-black or beetle green, and should look as if embossed or raised.

SCALE OF POINTS

Shape and colour of body and thighs, 10 ; back, 8 ; breast, 8 ; wings, 8	34
Head : skull, 3 ; eyes, 3 ; brows, 3 ; beak, 2 ; wattles, 2 ; lobes, 2 ; comb, 2	17
Carriage	12
Size	10
Condition	8
Shape and colour of tail	8
Shape and colour of legs and feet	8
Neck	3
	100

Serious defects : Crooked back, beak, or legs ; wry or squirrel tail ; in-knees or bow legs ; red hackle ; flat side ; single or Malay comb ; and in the hen, in addition, too light, too dark, or mealy ground colour ; or defective markings.

(It may be remarked that a scale of points is not given in the annual report for 1909 issued by the Indian Game Club, and that which appears above is a copy of the one published in the former—third—edition of the "Poultry Club Standards."—W. W. Broomhead.)

CHAPTER XXII.

THE OLD ENGLISH GAME FOWL.

THE bird known under this name stands by himself alone. In lineage none may compare with him, since his origin is absolutely lost in sheer antiquity, and when we do first hear of him, he is already of noble blood amongst other fowls. He has for generations been known as "the English fowl"—Buffon writes of him as such; and he has stamped his very name upon our speech, so that when we want to express a dogged courage that does not know how to yield, no matter what hopeless odds there are arrayed opposite, we say that our soldier heroes stood "game" to the last against their foes. He has earned the distinction well, lifting the name out of the very gutter—for it was first given him as being identified with "sport" or "gaming" in the old sense, so that household bills of James I. contain entries for the expenses of "cocks of the game for his Highnesse's recreation"—as he fought for his owners with the courage of his race; until at last the higher meaning of the word came not from them who had bestowed it, but from the bird who fought so undauntedly for a meaner master's stakes.

Let none suppose that all summed up in this was unmitigated evil. Rude times require rude virtues, and it will not be forgotten that the original of the very word virtue itself, stood equally for virtue and for courage amongst the Romans. Thus it occurred naturally, that nearly all primitive nations and civilisations deliberately sought to learn from the stubborn valour of the fighting cock. Every schoolboy will remember how Themistocles revived the courage of his soldiers by an example before their eyes of two cocks fighting, and afterwards instituted cock-fighting festivals. These festivals the lads were expressly directed to attend in order that they might learn courage; a course approved by such moralists as Socrates and Solon. The Romans followed the same example. Of more primitive peoples, some of the earliest Chinese records mention cock-fighting; in India there are notices dating back to at least 1000 B.C.; and the Persians had practised it for centuries before the Greeks learnt from their example. Cock-fighting has also been traced amongst the Phœnicians and some Jewish authorities believe that the Assyrian war-god Nergal was symbolised by a fighting cock, but this seems doubtful.

Antiquity of Cock-fighting.

It is impossible to determine whether or not cock-fighting was introduced into Britain by the Romans. If it did not previously exist there, it certainly would be; but as Cæsar tells us "that the Britons *kept fowls for pleasure and diversion*," though it was unlawful to eat them, the probability is that they found this particular diversion already there before them, perhaps introduced by Phœnician traders. The first authentic notice of cock-fighting as an English sport only dates back to the reign of Henry II., and is by William Fitz-Stephen; but it is to be observed that this notice records it as fully recognised and carried on at public schools, especially on Shrove Tuesday. At a later period we find the "cock-penny" payable by each scholar at Shrovetide, in order to provide cocks for the customary festival, a recognised custom if not a regular fee; and so lately as 1867 Mr. J. Fitch, one of the Schools Inquiry Assistant Commissioners, reported that this old cocking custom was at that date still the occasion for charging a *guinea and a half* to each scholar at Sedgebury School, the master receiving a guinea and the usher half a guinea, "for which the scholars received no equivalent." He adds that "at other free schools similar fees are collected"; but this we believe has come to an end since attention was thus publicly drawn to such a curious survival of ancient usage. These details are of special interest as showing that there was in England, as in ancient Greece, real and deliberate purpose of firing the youth of the country to a spirit of valour and endurance by the example of the courageous fighting cock.

Still, it was as "cocks of the game" that these birds were mainly bred, and a treatise upon their breeding, feeding, and management formed an important portion of all the earlier editions of *Hoyle's Games.* Now that cock-fighting, though still carried on in secret to a certain extent,* has otherwise become now a matter of history, some authentic details will be of interest. The following notes were kindly supplied by an old and valued correspondent of ours during many years, who told us that he fought and won his first main about the year 1840, *with the parish constables keeping order in the pit*, since which he had fought and assisted in scores of mains in various parts of England, Scotland, Wales, and the Continent. They will prove that some votaries of this sport have been neither low nor ignorant men; and record also a widespread and almost passionate attachment to it, which may be a revelation to some, and which is only to be explained by what we have already hinted at respecting an affinity with some phases of the English character. There can be no doubt that real and genuine admiration for the birds and their courage has lain deep at the root of it, however perverted. Many of the following details were given to us long ago, but at the date of the first edition of *The Illustrated Book of Poultry* it was not deemed advisable to publish them, for reasons which the lapse of forty years further have largely diminished.

Historical Details.

"For seven centuries cocking was more or less a national sport with us; and although disapproved and prohibited by Edward III. and our eighth Harry, who was so tender-hearted as not to allow the poor cocks to be fought for the amusement of his beloved subjects, the latter built a cock-pit at Whitehall, to himself, wherein to take his royal pastime. Many succeeding edicts were passed against it, including one from Cromwell, the Protector, a fac-simile of which, with his seal, I have now before me. It dates 'Fryday, March 31, 1654,' and is signed by Henry Scobell, Clerk of the Council. On the other hand, many of our kings have been partial to and encouraged cock-fighting, and it has been called a royal sport. King James was one of its royal patrons; and in the Travels of Cosmo III., Grand Duke of Tuscany, through England, in the reign of Charles II., 1669, it is said, 'Attended by Lord Philip Neville, Gascoigne, and Castiglione, his Highness went out in his carriage to the theatre appropriated to cock-fighting, a common amusement of the English, who, even in the public streets, take a delight in seeing such battles, and considerable bets are made on them. To render the cocks fit for fighting they select the best of the breed, cut off their crests and spurs, keep them in separate coops, and mix with their usual food, pepper, cloves, and other aromatics, and yolks of eggs, to heat and render them more vigorous in battle. When they want to bring them to the trial, they convey them in a bag, put on artificial spurs made of silver or steel, and let them out in the place appointed. . . . This amusement was not new to His Highness, for he had seen it on board ship on his voyage from Spain to England.' The above description is not far different from later custom; and to the monarch already named is ascribed the introduction of the Pile cock, so called from his different and distinct colours.

"To such a height was this sport carried in former years, that in old deeds tenants were bound to walk so many fighting cocks for the use of the lords; and in corporation accounts of expenses I have seen large sums charged for entertaining this or that dignitary with cock-fighting. In the Easter week of 1822, in one pit, 188 cocks, weighing together 7 cwt. 4 lbs. 6 ozs.,* were fought for sums amounting to upwards of £6,000. Still more recently over 1,000 cocks have fallen in a single season in one of our northern towns.

"Victory lay with no special colour. In Queen Anne's time a noted sportsman, named Frampton, had the best strain of cocks of the day. They were grey, with a brown, tawny wing, and the progeny of 'Old Sour-face' was long in high repute. Greys, Yellows, and Red Piles were also highly prized, and Bradbury's Duns and Whites fought their way into notoriety. In the eighteenth century the mealy Greys, with black legs, beaks, and eyes, of Hugo Meynell and Sir C. Sedley could scarcely be surpassed. Then followed Mr. Nunis's wonderful yellow Birchens, the Earl of Mexborough's true-feathered Duckwings, Sir Francis Boynton's slashing Duns, and Col. Mellish's Dark Reds. Lowther's and Holford's Light Reds with yellow legs cut down everything before them; and Mr. Elwes bred one of his red Duns that won twenty-seven battles. Then Vauxhall Clarke came into the royal pit to carry off the annual gold cup with his Greys. He bred different colours, and beating him was out of the question. The Cholmondeleys, Raylances, Molyneuxes, etc., bred Smocks and the light Cheshire Piles, that would frequently electrify the pit by dropping their cocks as dead as a log in a severe battle, with the long odds against them. Dr. Wing, of Leicestershire, bred all colours, and won with them. Sant's famous Derbyshire Dark Reds, with their dark-striped hackles, would always set the Derbyshire squires offering 100 to 80 on the battle; and old Nathaniel Monk, when sleeping in church at Dean, on being awakened by the beadle, cried lustily, 'I'll have the Black cock for a fiver!' so enamoured was he of the famous Black cocks of Lord de Vere. Mr. Sketchley, the author of *The Cocker*, astonished the readers of the sporting periodicals by the prowess of his Shropshire Reds; and Weightman, with his famous Parkhouse Reds, lowered the colours of the Lancashire men at Burton for the heaviest stake ever fought for; although it has been stated in error that Gilliver, when he won the main at Lincoln for £1,000 each battle and £5,000 the main,* fought for the largest amount. The Earl of Derby, too, bred some grand black-breasted, white-legged Reds and Duckwings; and his Pile was looked on by admiring thousands, as the engraving was long exhibited in sporting print-sellers' windows. Dr. Bellyse sometimes walked a thousand cock chickens out in a season, and was generally quite invincible. Once, on a sporting nobleman offering him £50 for a setting hen, he then and there lifted her off the nest and put his foot on the eggs; and on his lordship remarking that he bought the eggs too, he replied, 'If you had, I should have charged you a thousand.' His were about the only cocks that could beat Walker's celebrated Piles. I have not named a tenth part of the famous strains and breeders, but have mentioned sufficient to show that it was blood or strain that won, not colour; for even the Gurney Pied cocks were for a time thought to be superior to all others.

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* Only a few weeks ago we saw an advertisement asking for reliable spurs; and in recent years have seen steel spurs advertised, but all is now carried on under great difficulties, and decreasing more and more.

* The interest of this total consists in the proof that the average weight per bird was 4 lbs. 3 ozs. No cocks over 4 lbs. 8 ozs. or under 3 lbs. 0 ozs. were formerly allowed to be fought in regular mains.

The Old Game Fowl.

"The standard of a fighting Game cock is keenness of aspect, richness of plumage, and cleanness of feet. He must have a good boxing beak, very big, and crooked or hawk-shaped; large, full, fiery eye, and tapered head, not too long; for if the head be long and beak straight, he loses much holding-power when taking hold to strike; long, strong neck; flat, broad body, tapering wedge-shape to the tail; strong, long wings, so that when clipped the quills are of a powerful description; muscular, round, short thigh; legs (as to colour, I endorse the opinion of the most celebrated cocker of the nineteenth century, that the best he had ever seen were white, carp, and yellow, in order named as to merit) of good hard bone, and not at all gummy or fleshy like other fowls, standing with a good bend at the hocks, so as to have a full spring when rising, and in line with the body, not out or straddling; spur set on very low down; clean, thin feet and toes, with a long, open back claw; and to be light, corky-fleshed, looking large to his weight. The great thing is breeding for *heel*, since it is the heel that always wins, and although health and strength is a great desideratum, without heel it is nothing.

"The old breeders never on any account bred from a cock or hen that was not in the most perfect health. The cock's feathers must not be dry or loose: he should be ripe in the feel, his flesh firm, and his crow clear. A general want of constitution requires no cross, the only cure is total eradication. Some were ever crossing with this fine cock or that grand hen, but the produce seldom came up to their expectations; and no one can dispute that the best strains of cocks ever bred, were bred in-and-in, and as soon as crossed with others, though equally good, were robbed of their winning qualities. Meynell's cocks as well as his hounds were so bred, and perhaps the world never saw either more perfect. Sant's were so bred. The celebrated Coath's had not a cross for forty years, and yet they were seldom beaten, and not in the least degenerated. Those Cheshire Piles and Bellyse's Reds that so often put down their opponents by a single fly, and were as much prized by some old Cheshire families as their own birthrights, were of one family, and as they were so long thought to be the very best, nothing else was allowed to contaminate them. In fact, with judicious care and a due regard to health and age, not only the best cocks, but the best horses, cattle, and dogs that England has been so justly proud of, have been bred in-and-in.

"They should early be put to separate walks that are healthy, where there is not a great number of hens, where they will neither be kept short of food, nor so hand-fed as to render them heavy and inactive; for the more exercise a cock takes in his walk, leading forth his hens, etc., in search of food, so much more agile and active will he be in his battle.

Training and Fighting.

"At two years old the cock is at his best for fighting; previous to which he went into the feeder's care, who reduced his weight, and got him into that high state of health and condition which centuries of close observation had brought to perfection. From very early times the craft have kept their secrets a profound mystery. At the middle of the eighteenth century, the cocking instructions of that scarce work, *The British Legacy*, published as a very special addendum, 'The following choice and valuable secret for feeding a cock for four days before fighting, which was communicated by a noble lord to J. Macdonald, M.D., by which remarkable and valuable method ninety-three battles have been won out of one hundred; now first published, by permission,' etc. etc. It was subsequently published in *The School of Arts*, and consisted of bread made of the flour of millet, rice, barley, vetches, cochineal, the whites and some yolks of eggs, wetted with ale, and baked for four hours, with which the cocks were fed after being purged, and with a slight allowance of bruised seeds and corn, and cooked flesh. Many other recipes for 'cock-bread' have been published at different times.

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* These figures are authentic.

"Cocks put up and in training were weighed and their match colours and marks taken and noted three days before fighting, when each feeder would produce his birds as light as he could, and as soon as weighed and matched, proceed to get them up as quickly as possible to their highest weight. The birds would be occasionally purged if they were thought to require it, and at intervals muffles* were put on and they were sparred a little for exercise and to keep them in good wind.

"Previous to fighting the wings were cut from the first rising feather slopewise. Hackle and cloak-feathers were shortened, the sickles all cut off, and the feathers around the tail, vent, and under the belly were cut short. The natural spurs being previously sawn off to about half an inch long, the silver or steel spurs were then placed on, and this again is supposed to be a great art by some; but I affirm it must be bred in the cock, and it is impossible to put on spurs to a bad-shaped cock to kill quickly, while a child can put on the spurs to a proper-shaped one. They must be padded firm in the socket, not tight, and rest well down on the leg, then tied tightly enough to prevent their moving, but not to cramp him, and from the natural spur place it in line with the outside of the hock. Then the handler stepped on the scene, who required a calm temper, as well as a quick eye and light hand, and had to take into consideration the condition of his opponent's cock as well as his own, otherwise he would not know when to force the fighting or when his bird required rest. This was the most difficult part of the whole routine of cocking; and Fisher, Straddling, Martin, Gomm, Probyn, Porter, and Fleming often won mains of importance by their exertions alone. Fleming was, perhaps, the cleverest setter that ever entered a cockpit.

"The Cockpit Royal, Westminster, was formerly the chief place for this sport, although there were many other public pits in the metropolis, and more than one of the London theatres was originally used for this purpose—Drury Lane for one; the next in importance was the royal pit, at Newmarket, immortalised by Hogarth. Hogarth is not the only one who has painted such scenes, as Vandyke, Elmer, Marshall, Barringer, Fielding, Alken, Cruikshank, and Wilson also painted them—the latter, a very large painting of the Salford pit and noblemen who frequented it. Neither were London and Newmarket the only places that supported cockpits, for few towns of any size were without one, and many cities and towns had established cockpits under patronage of their respective corporations; as an example, the Canterbury Corporation pit was an apartment of the beautiful gateway forming part of St. Augustine's Monastery, and this is not by any means a singular instance of the church and cockpit forming close alliance, either at home or abroad. A former venerable Dean of York bred such cocks as to trouble even Weightman with his best to beat them, and had he lived might have seen the old keeper of the York pit in charge of a Nonconformist chapel. On the site of the old Aintree pit there has been built a new church. The law, too, as well as the church, has been mixed up with this now tabooed sport; old gentlemen are still living who recollect, in attending to their professional duties at county sessions, having a six days' main of cocks fixed for the same time; and although the sessions might have been got through in the first two or three days, those magnates of the law would have been troubled with serious thoughts of having shirked their duties had they left before seeing the last battle in the six days' main decided.

"The Melton Mowbray pit, I believe, was the last built in England, at a cost of 700 guineas. The Subscription pit, at Chester, was one of the last abandoned, and no pit in England, perhaps, could boast of more aristocratic patronage, heavier betting, or superior fighting. The first main ever fought there was a main between Ireland and England of forty-three mains and ten byes. As the celebrated Doctor Bellyse represented Old England, he won, as he almost invariably did. The writer of this was, by the courtesy of the then occupier, forty years ago invited to see the spot where for years Ralph Benson's Shropshire Reds contended with the Piles and Reds of Cheshire to the admiration of all the old county families of Lancashire,

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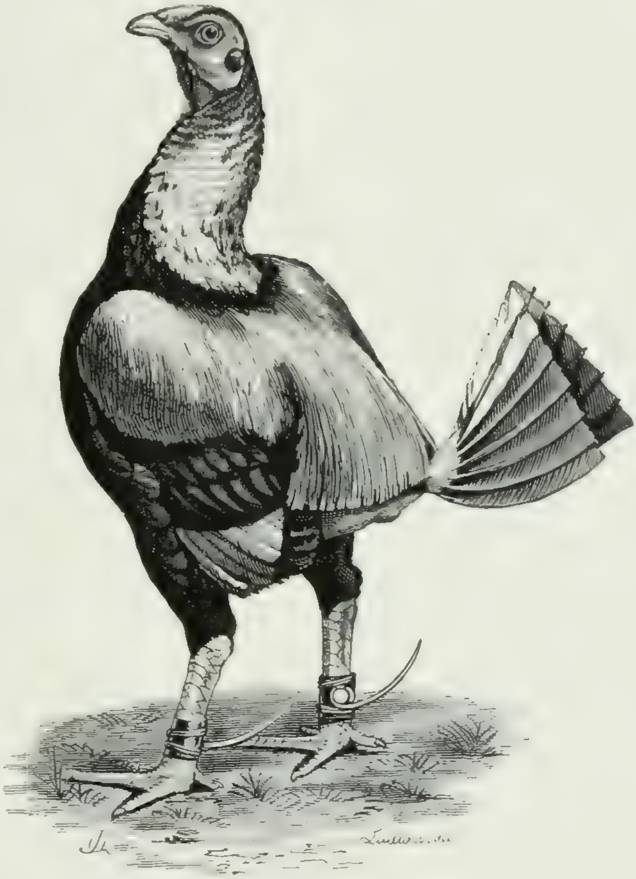
* Leather muffles were fastened over the already shortened natural spurs, to prevent any serious injury, and the birds thus protected allowed to fight for exercise. The beak alone does little harm, and they were of course watched to prevent any real damage.

Cheshire, Shropshire, and a great part of Wales. At that time the seats were all removed, and the pit used as a confectioner's factory; the feeding-pens were turned into a nice sitting-room, and the rooms where hundreds of thousands have changed hands, and where they formerly betted in a madness of frenzy, were and probably are now used as bedrooms. The skeleton remained much as formerly, the inside being about 45 by 45 feet, and between 30 and 40 feet high. There were nine large windows and a glass dome over the pit, which was some 20 feet in diameter. Of all the stirring scenes that quaint old Chester has witnessed, some of the most exciting have taken place in that now quiet building.

Mains or Matches.

"Of the different matches made, the most usual was to show say twenty-one pairs of cocks, which was called a short main. They were weighed, and all that fell within one ounce of each other were fought for so much per battle, and so much the odd or main. It was also formerly a practice at the Westminster pit to show sixty-one pairs. They were weighed, and the colour of breast and body taken, as well as the eyes, legs, nails, shape of combs, marks (as 'in-right' or 'out-left,' mouldy ears, peak-backed), etc.; then all that fell within one ounce of each other were matched, and divided into three or six days' play, the lightest pair beginning the main three days after weighing: this was called a long main. At Edinburgh, on one occasion, a long main was fought which lasted twelve days, and was finally drawn. There were matches made for turn-outs; each side got a certain number of the largest cocks obtainable, and fought them without weighing: this is said to be of Dutch origin. There were, besides, the Welsh main, and the battle royal, which last has become quite proverbial. In the battle royal any number staked a certain sum, and produced a cock under a stipulated weight, and each standing round the pit tossed in his cock (same as was customary with the masters of a match with the first pair of cocks in a regular main), and the last living cock took the whole of the money staked. There were also mains for set weights. In the Welsh main, sixteen cocks were first matched up in pairs, the nearest weights being matched together. Then the winners were matched again (just as successive 'heats' are decided in a race), and so on; so that the ultimate winner had to fight four battles. All mains have an odd battle, to prevent the main being a drawn one, as it would be by each party winning an equal number of battles. Notwithstanding, this occasionally happened by the odd battle itself being drawn, both cocks being struck dead at the same time, for instance."

The writer of the foregoing interesting notes kindly supplied a Game cock trimmed or "cut out" and heeled for fighting, of which the engraving is a representation, being carefully drawn from life forty years ago. The bird was bred in Cornwall by the late Mr. John Harris, who until his demise in 1910 preserved the blood, and was from a Coath's hen of the Red Derby strain, by one of Holford's black-breasted, yellow-legged, light Reds. It won five matches, and fought in three mains, mostly in the pair of Watling's steel spurs depicted.


Game Cock Trimmed and Heeled.

From the same source we are enabled to give a few particulars and interesting illustrations of the artificial spurs used in cock-fighting. It is doubtful if ancient nations used these, but for hundreds of years more deadly weapons than those provided by Nature have been used

Artificial Spurs.

in England and the East, though the fashion of Oriental and Occidental spurs radically differs. In the East the spurs are two-edged knives: English spurs were always points only, edges not being allowed. Patterns have at one time or another differed considerably, as will be seen from Fig. 112, drawn partly from specimens and partly from an old print. The left hand example shows the more usual pattern, and it will be seen that even in this the spur starts from below the natural weapon, thus increasing the "heel" of the bird. But this was sometimes increased, as in the centre specimen, called a "full-drop socket," or the one on the right, termed a "half-drop socket," which brought the weapon still nearer the foot. These extremely lowered forms, however, were considered unfair, and it came to be a usual condition in matches that they should be fought in "fair" silver or other spurs. The illustration also shows how leather flaps were stitched round the metal socket, these flaps being wrapped round the shank of the bird, and the whole then firmly bound round.

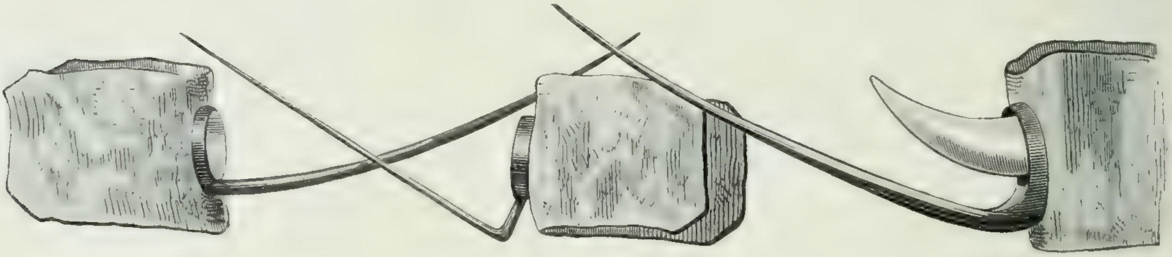


Fig. 112.—Old English Steel Spurs.

Both steel and silver were employed for spurs, or rather an alloy of the latter metal, for a Game cock strikes with fearful force, and only metal much stiffer and tougher than pure silver would stand the strain. Much study was devoted to such alloys, and the contributor of these details informed us that in his own day he knew a man who paid £10 for the supposed formula, and further expended over £40 in experiment, but failed to produce the old temper of metal. Hence genuine old silver spurs are highly prized by those who still practise cocking in secret; and we well remember, after a descent of the police at Aintree in the 'seventies, that the chief cause of chagrin amongst various persons we were acquainted with, was a number of valuable old spurs being seized and confiscated; "the loss was irreparable." The manufacture was a distinct trade, specially carried on in Cockspur Street, to which it gave the name, but not confined to it by any means. The best makers of silver spurs were the Clays (father and son), Gregory, Smith, Gatesfield, Green, Toulmin, and Vincent, the latter keeping in employment a dozen workmen at the time of his death in 1797.

We give in Fig. 113 figures of three silver spurs of various lengths and patterns. Of these A is by Toulmin, B by T. Smith, and C by the elder Clay. This last spur is of some historical interest, the pair having been presented to Charles II. by Nell Gwyn. The usual price of a pair of silver spurs was two to three guineas, and a reputation in this line of business was highly valued, as may be seen from the following, which we have copied verbatim from the trade label pasted inside the cover of a box of spurs by Toulmin, who it will be seen succeeded Gatesfield, who had in his turn succeeded Smith:—

SAMUEL TOULMIN,

Silver Cockspur Maker, successor to Smith and Gatesfield, at the Dial and Crown, near Hungerford Market in the Strand, London. *N.B.—Mr. Gatesfield was friend and successor to the late Mr. Smith, mentioned in Mr. Hallam's ingenious Poem called the* COCKER, *page* 58.

As curious Artists diffrent Skill disclose,
The various Weapon diffrent Temper shows,
Now curving Points too soft a Temper bear,
And now too hard their brittleness declare;
Now on the Plain the trecherous Weapons lye,
Now wing'd in Air the shiver'd Fragments fly,
Surpriz'd, chagrin'd, th' incautious Feeders gaze,
And *Smith* alone ingenious Artist praise.

Steel spurs, which sold at 50s. to 60s. per dozen pairs, also had their celebrated makers. The temper of those by Singleton of Dublin, was as proverbial as that of O'Shaughnessy's Limerick fish-hooks; those of Kendrick of Redditch, and Ross of Bloxwich, were also highly prized. Sheffield had several good makers; and in the West Country the manufacture of J. Watling, of Exeter, was preferred to all others. Great attention was given to what were thought the most deadly curves, and to the spur being able not only to penetrate, but to cut its way out again. Of the steel spurs shown in Fig. 114, D is by Watling of Exeter; E by Singleton of Dublin; F by Ross of Bloxwich; and of the different forms which will be noticed, each was thought much of by its admirers of a bygone day. Steel spurs were also plated with silver, and as the plating of those days was mechanical, not electro, these could scarcely be distinguished from silver spurs of similar shape.

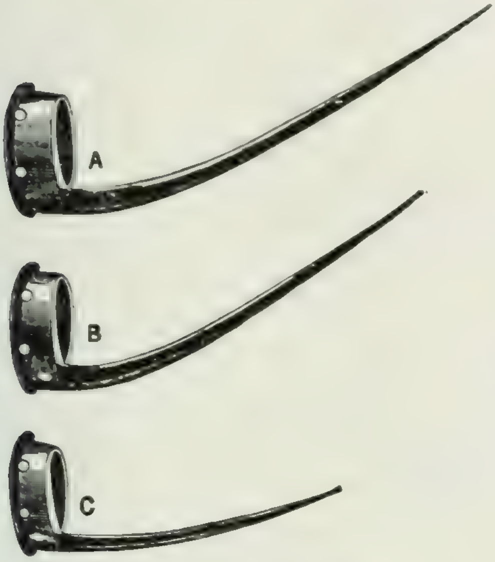


Fig. 113.—Silver Spurs.

Barbarity of Cock-fighting.

Such then was cock-fighting; such were its methods, its votaries, and the scale upon which it was carried on in the days of our grandfathers, or perhaps some of our fathers. It is not so necessary now as it was even in 1872, to declaim against the cruelty of it, since its total suppression is only a question of time; but it still seems necessary to point out clearly wherein the "brutality," which we must still ascribe to it, really consists. That does not lie so much as supposed, in the actual suffering of the birds themselves. It is curious that some of the original promoters of the Society for the Prevention of Cruelty to Animals expressly exempted cock-fighting from their strictures. One of them —and not himself addicted to it—points out how the Game cock is kept in comfort till the day of battle, and then cannot be forced, but is actuated by his natural instinct, "and in fact gratified." Another remarks very much to the same effect; while many have pointed to "Nature's laws" as ordaining fatal combats of the same kind. This last argument is not sound, since it omits to consider that in the case before us the fighting instinct has been developed by the *selection of man* until it has attained an intensity that does not exist in Nature left to herself. Nature's combatants do not as a rule fight to the death, but when one is thoroughly whipped, it gives in or runs away; in the Game fowl courage and spirit have been developed artificially, until a bird has been produced that *cannot* yield till death, or if he does, is at once ignominiously consigned by his master to the pot, a vengeance Nature does not inflict. That is to be remembered; but there can be little doubt that if a Game cock had the choice offered him of having his neck wrung or meeting an antagonist, he would unhesitatingly prefer the latter, and is conscious of little beyond the fierce joy of the combat, during all that befals him. In mere suffering of the victim, the old apologists were probably right in placing their favourite sport below shooting and some other "sports" which still hold their ground.

Neither, as many suppose, can the use of metal spurs be deemed additional cruelty. As the contributor already quoted remarks, "If two cocks are left together in a state of Nature, death to one or both is a natural result, but it is likely to be the work of hours; whereas a battle with two heeled cocks in good condition rarely lasts

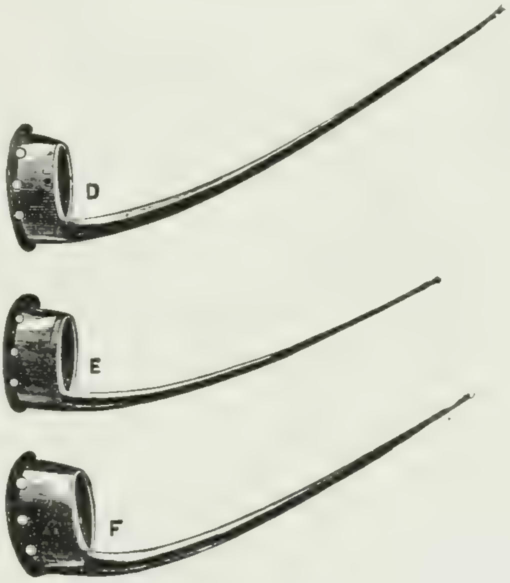


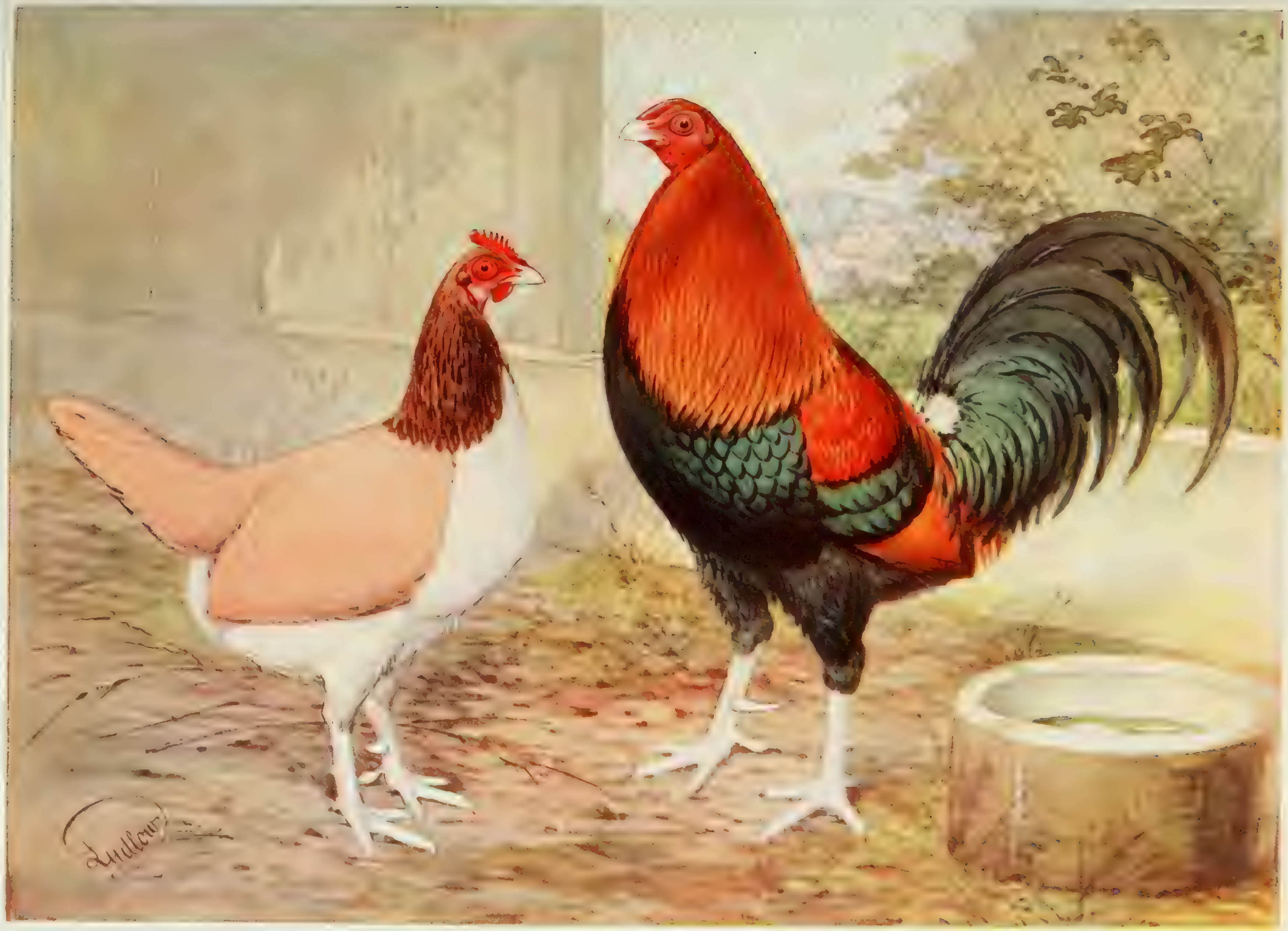
Fig. 114.—Steel Spurs.

five minutes, and a great many are struck dead much quicker than if their heads were cut clean off." It is indeed a somewhat mysterious fact, of which we are assured by many whom we implicitly believe, that while the difficulty of (apparently) killing a fowl is proverbial, very often a struck cock appears to die instantly: the excitement and brain pressure having probably something to do with this phenomenon, which seems a merciful provision of Nature, or rather of that Power which overrules her provisions. Thus metal spurs actually lessen, by shortening, the pain inflicted; though there can be no doubt that individual blows are more sharply felt, since some birds that will fight stubbornly in a natural condition "will not stand steel," and others which have fought well in steel, have flinched under a long battle in silver spurs, which, being thicker, do not cut such deadly wounds. In America, spurs over 1¼ inches in length are often debarred, expressly in order to prolong the contest, and an enthusiastic cock-fighter recently wrote that "a good *long* battle in silver spurs is the onlv cock-fighting worthy of the name."

From this and other causes, the actual suffering often lasts much more than the "few minutes" spoken of above, and is of a kind which we must indicate, however briefly, by a few examples (which we have quoted before) from unimpeachable sources. An American writer (Dr. Cooper) in his work on *The Game Fowl*, gives an acccunt of a main between New York and the Daffodil Club of Porchester, consisting of seven battles. These occupied respectively eight minutes, forty minutes, thirty minutes (drawn), forty-three minutes, thirty-three minutes; the other two not being stated. One bird fought on for forty minutes with a broken wing; and in another battle "an unlucky *coup*" blinded the Daffodil cock, which nevertheless kept on, till he somehow got hold of the other and finished him after all; for which he is enthusiastically compared to the "old Jackson strain," which it is said had an actual reputation for "fighting better after losing their eyesight." In another report of a main at New Jersey in January, 1873, in four of the ten battles fought, blinding occurred; "New York had both eyes torn out" being the words used to describe such a result. By all the rules, legal provision is made for birds being struck blind, what is to be done in such cases being laid down.

Such are the actual facts of the cock-pit, as described by those who have delighted in it: but as already remarked, the amount of suffering involved is not the real point, and forms of sport not tabooed by society, may really involve more to the individual animal. The great difference lies in this: that in other sports the suffering, be it what it may, is only incidental, and is either unnoticed or forgotten. In the "run across country," passing by the fact that one fox affords the enjoyment to a large number (which is of course not any real argument at all, much less a sound one), most of those who participate *never see the fox suffer*, or ever think of it: the excitement and the run is all they are conscious of. To the lady who receives the brush, it is at that time only a "brush"; she has not *seen* the fox "broken up," or torn limb from limb by the pack. If she *had to watch that* every time she rode to hounds, it would be very different; it is because it is not so, that such sports have no inherent brutalising tendency upon those who take part in them. But in cock-fighting it is far otherwise. The sufferings of every bird have the riveted attention of every person engaged, who is thus habituated to disregard the constant sight of blood and pain, in the excitement of the contest and of gambling upon it. Such a state of things marks off any "sport" in which it is essential, widely apart from any other where it is not, whatever be the actual amount of pain actually caused. Take a quite different case: it is not cruel to kill animals for food, if due care is taken to avoid unnecessary pain; it is right to do it, and the most refined lady who eats meat really does it by deputy, however she may look down upon the butcher. But if the slaughter-house were *made a spectacle*, at which scores looked on, to grow excited and lay odds upon the duration of life or the symptoms of death, then it would become as brutalising to the spectators as was the Roman arena. Like that, the moral evil would consist in finding pleasurable excitement in the *actual circumstances* of blood-shedding, suffering, and death.

That is the real character of cock-fighting. Every fresh injury to either bird is eagerly watched, and perhaps recorded in the betting, and has to be deliberately *disregarded* by the "sportsman" except from that point of view. In rough and rude times, when men sought to inculcate disregard of pain and suffering as a bulwark of the State, this had use and excuse, and helped to "make men" who fought the world: we recognise all that, and that there are some even now from whom these instinctive feelings hide much else; but there are too many proofs of the inevitable brutalising effect of the cock-pit upon the mass of its votaries. The faces of the crowd in that very picture by Hogarth alluded to by our contributor in his notes on page 350, tell their own tale; and we have seen it as plainly written in those of the



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OLD ENGLISH GAME: BLACK-RED COCK AND CLAY HEN

majority of a company arrested and charged in a modern police-court. Years ago we quoted an American champion of this "sport," who made the terrible vaunt that he could take one of his celebrated birds, and cut off both of his legs and wings, and the bird would fight then! We hope and believe that no Englishman could make such a sickening boast, and no English journal publish it; but it is a terrible proof of the callous brutality to which man *can* be brought by habitual seeking of excitement in the spectacle of animal suffering. We are sure that we need add no more.

This noble breed is now widely exhibited and still more widely bred, for its beauty and its quality of flesh. In combination of grace with agile strength it is unequalled, and the qualities for which it was bred produced also the utmost proportion of muscle (flesh) in the best places for the table, so that in wings and breast-meat it had no superior. It found its way into the exhibition-pen in the earliest days of poultry shows; but there, unfortunately, the changes of fashion of which other instances have been quoted already, played havoc with the breed. At first changes were slight, the birds being only slightly more tall and "reachy," which was generally admired; but the change went on, as shown in our next chapter, until the breed had been transformed out of all recognition. At last a reaction set in, and in 1882 a class for the "old" breed was offered at Cleator Moor in Cumberland, followed by classes with a special judge at Wigton in 1883; ever since which time, classes and popularity have increased continuously. In 1887 the Old English Game Fowl Club was formed, to encourage and watch over this noble breed, the first secretary being Mr. J. W. Simpson, at that time of Silloth, in Cumberland, a county which was long the headquarters of the Old English Game.

Revival of Old English Game.

For the following article on the fowl as now bred and exhibited, we are indebted to Mr. Herbert Atkinson, of Ewelme, Wallingford, one of the vice-presidents of the Old English Game Fowl Club.

"The Old English Game fowl or British Game fowl of Buffon is a great contrast to the modern exhibition, or fancier's breed of Game, in almost every particular. It was owing to the modern variety having been so continuously bred for show points for a considerable period as to have very much modified nearly all its useful qualities, that some fanciers began, about 1885, to try to revive the breeding and exhibition of the old English breed of Game fowl, as it used to be bred for cock-fighting, when that sport was recognised as one of the national and even 'royal' sports of this country, ranking even before horse-racing in importance, antiquity, and popularity. This sport was suppressed in England about 1835, and some fifteen years later Game fowls began to be exhibited at poultry shows. By breeding for certain and entirely fancy points, and by selection, and crossing with alien breeds, the modern Game fowl had been produced. It was necessary therefore to seek out the old breed again, either from old breeders who had kept them pure, or from cock-fighters. These old breeders, and 'cockers,' had all these years kept the breed in its purity of blood, and vigorous constitution, never exhibiting, never selling, merely keeping them solely for love of the old breed, and it was therefore at first almost impossible to obtain them. However, one way and another, many birds of good blood were obtained, and exhibited; their useful qualities were soon re-discovered and appreciated by several modern fanciers; and from the first shows where classes were provided for them in the 'eighties, they have increased in numbers by leaps and bounds, until at the present time they form some of the largest classes at all the important shows. This is less a cause for wonder when we consider their great beauty and many useful qualities, to say nothing of the liking of most Englishmen for anything thoroughbred; and nothing can exceed the thoroughbred racehorse and the Old English Game cock in purity of blood, unless it be the Arab horses and the native Indian Game, or Aseel, as we now call him. While other breeds of poultry and horses, etc., may be what the Americans call 'standard-bred,' they cannot trace a pure pedigree for any great period of time.

"Returning then to the useful qualities of Old English Game, they stand not only in the front rank as table fowls, but surpass all other breeds in delicacy, flavour, and nutritive qualities of flesh, while they carry more of it, in proportion to bone and offal, than any other breed, while in flavour it vies with that of the pheasant. They of course lack the great size of the Indian Game and some others, but that size is only produced together with great bone, offal, yellow skin, coarser meat, and large appetites. Old English Game chickens grow fast, and are always plump and full of meat, not requiring to be fattened, which indeed they will not bear, owing to their restless temperaments. If allowed to go at liberty with the hen on a good range, they require but little

Qualities of Old English Game.

feeding; indeed, will almost keep themselves, and show such glossy plumage and condition as can be obtained by no other method. As layers there are several varieties of this breed that (on a free range) equal any of the sitting breeds of poultry; Hennies, Black-breasted Reds, Piles, and Duckwings leading the way, while perhaps the worst layers are the dark Brown Reds and dark Greys.

"The hens are all most excellent sitters, steady on their eggs, and regular in their leaving and returning to the nest, but they will brook no interference, unless very tame. They are excellent and careful mothers, and go with their chicks even after recommencing to lay, while the marauding rat or cat had better beware of trying to take one of the brood, for she will fly at any foe in their defence. Beware, however, of having the hens with chickens near together, or a terrible fight may ensue between the two mothers to the detriment of the chickens, as after her separation during sitting, and after the chickens are first hatched until they are let go at liberty, she will appear as a stranger to the other hens.

"Old English Game cocks are seldom anything but gallant and attentive to their harem, and will fight in defence of their hens, instances having been known of a Game cock with full natural spurs having killed a fox that was carrying off one of his hens. Now and then they will take peculiar dislike to a hen of some particular colour, or with a large comb, in which case remove her at once or she will be killed. Instances are also known of Game cocks sitting and even hatching eggs; I have known two such cases amongst my own birds. It is almost impossible to keep two Game cocks together, as they would fight and destroy each other. This can be obviated by keeping an adult two year old bird and a young cockerel, but even that is not safe, for some day the young one will turn, and then it means death or injury to one or both.

"This inherent quarrelsome disposition, so characteristic of the breed, renders it unsuitable for those who have only a confined space, or desire to keep a large number of fowls; and confinement does not suit them: the chickens come weakly and the hens become indifferent layers. The Old English Game is essentially the breed for the country gentleman, who desires fowls and eggs for his own table; and being obtainable of so many different colours, their owner has only to choose his favourite hue, or the combination of colours that pleases him best. For the cottager too, who has a free range, no breed is more thrifty, having small appetites and being most excellent foragers, never standing idle for hours like the Asiatics, but ever moving and seeking for insect life, etc., ranging the grass and hedgerows; near a road, or in a farmyard amongst cattle and stock, and in the stable-yard, they from their fearlessness and activity in avoiding danger are an ideal breed.

"For crossing purposes it is always best to use the Old English Game cock, with large hens of another breed. With all the Asiatic breeds he is an excellent cross, giving quality and breast meat, which all birds of these varieties lack. With Dorkings a most splendid table-fowl is produced. With all the boasted best crosses (and their name is legion) none will bear a comparison for quality and quantity of flesh combined, with the oldest and only pure English breeds combined, the Game and Dorking cross. The Game-Houdan is a wonderfully prolific layer, besides being of excellent table qualities. Game-Plymouth Rocks, and Game-Wyandottes are capital winter layers; indeed any of the larger breeds are greatly improved in utility and quality by crossing with Old English Game, improving, as he does, their table, laying, and foraging properties. The late Mr. John Brough of Carlisle (who won such a number of prizes with Old English Game when they were first revived in the show-pen) was so well aware of the fine table and utility properties of this breed in his business as a poulterer, that he kept large numbers of them all round the district, from which he obtained his most prime supplies, and had done so long before their advent in the show-pen.

Points of Old English Game.

"The points required in the Old English Game cock are a small tapered head, with a strong hooked beak, rather short and pointed, a quick, large, and fiery eye, the skin of face and throat of fine quality, loose and flexible; a rather long and very strong neck, a short flat back, wide across the shoulders, and tapering to the tail, which should be large, strong, and spread; breast large and wide, the pectoral muscles largely developed, and the breast-bone straight; the belly small and tight; the wings large, long, and strong; with short, round, and muscular thighs, and clean-boned, strong legs parallel with the body and well bent at the hocks. The spurs should be set on low, and be thin and sharp, the toes long, thin, straight, and spreading; the hind toe flat on the ground and extending straight backwards, the nails long and strong. His feathers should be hard, close, sound, and glossy, and his carriage should be proud, quick, graceful, bold, and smart. Such a bird should when taken in the hand feel firm in flesh and at the same time corky, or springy, and warm, drawing his legs well underneath him. He must be well balanced, and 'clever,' that is, every part in due proportion, so that he sits easily in the hand, not lumpy or helpless; the thumbs should not sink in between the wings and the back, but be firm across; there should be very little fluff or underdown on him. His weight should be about 5½ lbs. or 6 lbs., larger birds generally being coarse and dull, and lacking that alertness and quickness so desirable in this breed.

"The hen should, as far as her sex will allow, possess all these points. Her head should be small and tapering, comb small, straight, and evenly serrated; very thick, curved, and pointed beak, large, bright, and full eye; strong shanks, the bone of fine texture, hard and evenly scaled, and if spurred, and of the same colour as eye, beak, and plumage, it is a sign of purity of race and high breeding, flat clean feet, with long tapering toes, wings very long and full, with hard, strong quills, tail large and fan-shaped, carried well up denoting strength and courage, as a weak low tail indicates weakness and a craven spirit. She should be wide in breast and back, and taper nicely to the tail; the importance of the hen cannot be overrated in producing Game cocks.

"In colour of legs much latitude is allowed, the rule in breeding being that the eye, beak, and legs should match in colour. In Black-breasted Reds, for instance, white, yellow, carp, etc., are allowed to compete on an equal footing, each breed having its admirers, and being equally good and handsome. The white-legged ones may have also grey or daw eyes, as not only have some breeds (the Lord Derby's always had them), but they match the legs and beak, and the white under-plumage of these birds, which also usually show a few feathers wholly or partly white, in wings or tail, all in character with it.

"The colours in Black-breasted Light Reds are much the same as in the modern Game, except that in the Old English the colours are richer and more brilliant, and may be darker, as some little latitude is allowed. For the hens, partridge colour is to be preferred to wheatens, the latter being used to produce bright hackle and saddle in the cocks, and if persisted in, also producing mealy breasts, while those bred from good partridge coloured hens produce sound coloured cocks, though a trifle darker in colour.

"Brown-breasted Reds may have clear brown or robin breasts, or brown shaded or marked with black; the hackle and saddle are dark red or dark orange, and the eyes and legs dark. The hens to match them should be a rich dark mossy brown all over, or they may be black with a tinsel hackle; of course legs, eyes, and beak to match the cock.

"The Silver Duckwings are in colour the same as the modern Silver Duckwing Game, or the Silver-grey Dorking, and should be kept to their own colour in breeding, and not crossed. The Yellow Duckwing may also be bred from Duckwings entirely, or can be produced by crossing with Black-breasted Reds, which will produce bright and rich coloured cocks, using either a Duckwing cock with a Partridge hen or a Black-breasted Red cock and Duckwing grey hen, though nearly all the pullets bred this way will show ruddy wings, which are fatal in the show-pen.

"Duns (or, as they are improperly called, 'blues') may also be crossed with Black or Brown-breasted Red cocks; the former with a blue hen producing Dun-breasted Reds or 'Blue Reds,' as fanciers are apt to call them, and a Blue hen with gold hackle and a Robin-breasted Red cock producing excellent 'Red Duns.'

"Piles are much like the modern in colour, but brighter. Some prefer the white-breasted birds, but the streaky-breasted are also very handsome. The colour is liable to become lighter unless an occasional cross of the Black-breasted Red is used.

"Blacks and Whites should, of course, be bred from pure self-coloured birds.

"Spangles are very popular in the show-pen at present. They may be bred from Spangles, or as a cross with Black-breasted Reds, which also produce very good Red Spangles.

"The Black-breasted Black Red is a breed that is considered one of the best and purest strains, and one that should be revived if not too late. The cock is a clear vivid dark red free from spot or streak, on hackles, shoulders, back and saddle feathers; while his breast, belly, tail, primary and secondary wing feathers, his thighs, legs, beak, and eyes are jet black, and his under-plumage black all over, also beneath his hackle; the hen to match him is a dark partridge, brick breasted, with hackles red above, and black beneath, and beak, eyes, and legs black also. No breed was more celebrated than this in the old days, and it is much to be regretted if it is allowed to disappear from amongst us.

"The Henny is also another most useful breed, being perhaps the best layer among Game fowls, and certainly in the front rank for the table. It is a very ancient breed of Game, and perhaps has been kept more free from crossing with other Game fowls than any other breed. The cocks are feathered like the hens, hence its name, and the more hen-like their plumage, that is, the more rounded and free from sheen are the hackle, saddle, and tail feathers, the more are they entitled to claim purity of race. They are chiefly bred in Cornwall and Devonshire, though some celebrated birds have come from Wales. In colour there are dark partridge, red grouse, wheatens, greys, duns, blacks, whites, and spangles. The partridge and grouse coloured have generally pinkish white legs; these and the blacks are perhaps the most beautiful varieties. They are perhaps the most useful of all the breeds of Game. To some the lack of gaudy and shining plumage on the cock will make them appear plain, but there is a certain 'gamey' appearance about a good hen-cock that renders him very pleasing to the eye of one who understands Game fowls, and appreciates them.

"There are very many other colours of Game fowls, but until they are more generally exhibited, a description of them is scarcely necessary. There are also strains of birds having peculiar marks, such as the 'Muffs,' having a bunch of feathers growing beneath the throat, and the 'Tassels,' having a tuft of feathers behind the comb, which may be either a few straight feathers in the cock and a small tuft in the hen, or something very much larger, as sometimes seen, and amounting to a large topknot. These peculiarities are pleasing to some people, and where they are followed by good qualities, it is well to preserve them with every care.

"The Old English Game Fowl Club's Standard of points and colours seems to render further description unnecessary; but it may be well to give the proper way to describe the colour of a Game fowl. Experts always started with the breast, as in cock-fighting times this part was untrimmed and left intact; thus a black cock was described as a Raven-breasted Black, black eyes, beak, and legs; and a white cock, Smock-breasted Smock, white legs, beak, and eyes. Nowadays, a *Black-breasted Light Red* is often spoken of as a *Black Red*, a term at once misleading and ridiculous, and might mean anything, the black-breasted black red with crow-wings being the only colour to which the appellation black red applies; light red would be more intelligible. Usually the colour of some wild bird was used in describing the breast colour, as Raven-breasted, Throstle-breasted, Robin-breasted, or Pheasant-breasted, etc.

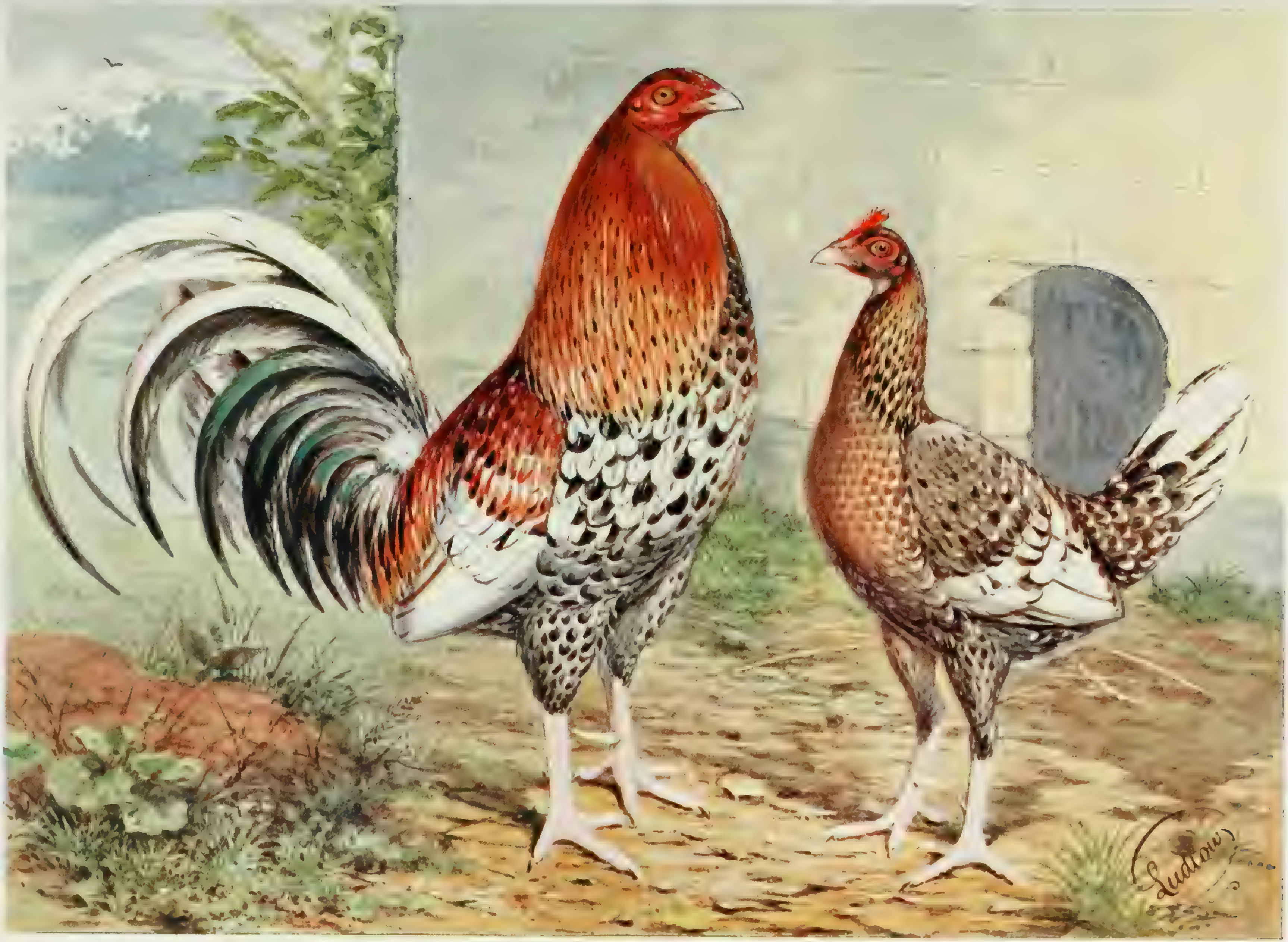
"In rearing Old English Game chickens, it is well to keep them as dry under foot as possible at first. After a week or two they never grow better than if allowed to wander with their mother on a good range, and they will roost in the trees the winter through; but as it is not always convenient to allow them to do this, it is at least desirable to separate the cock chickens from their sisters at about three months old, when if put out of sight and hearing of any hen or pullet and under the charge of an old cock, they will usually run together peaceably, until they are ready to be separated to go on to walks. At five months old it is necessary to dub them. Snip off the comb and each wattle, taking care not to cut across the throat, and then take off the ear-lobes. The operation will not take half a minute, and the birds will eat directly after, showing how little pain is caused by this slight cutting, which saves the bird many a painful time, and often his life, when he meets a strange bird on his walk or gets out of his yard. The dubbing of this bird requires merely the removal of the comb, wattles, and ear-lobes for the bird's good; no severe cutting, trimming, or skinning is resorted to for appearance' sake, as in some modern breeds trimmed merely for appearance, and to win prizes by unprincipled 'fakers.'

"Plenty of pure water is absolutely necessary for Game fowls, and the evening meal should always consist of good, sound English grain: wheat, barley, and occasionally oats, and a few peas; maize is not at all a suitable food for Game fowls, being too fattening, and often producing 'scaly leg' and stopping the production of eggs.

"This breed requires but little preparation for exhibition, as they never look better than when straight from a good range. They do, however, require to be tame, and should be placed in an exhibition pen a few times, and given some choice morsels to render them used to being handled, etc., as no judge can see the points of a bird if wild and crouching in his pen, or flying wildly against the top of it. If in good condition, just washing the feet, legs, and head will be sufficient, or should any feathers stick up each side of the cock's comb, they may be removed.

Judging Old English Game.

"In judging Old English, the first thing to be looked for is purity of race, gameness of aspect, cleanness and soundness of legs and feet, not to be thick toed, or with round fleshy shanks as are often seen, and his large fierce eye, whether it be dark, red, or grey. Then look to his shape, and then to his feather, if it is sound and glossy, elastic, and full of bloom, not soft, thick, or fluffy, as is often seen in inferior birds Then take him out



OLD ENGLISH GAME: SPANGLED.

and handle him, and if firm in flesh and feather, clever in hand, with strong neck, and root to his tail, long and strong wings with sound unbroken quill feathers, and straight in legs, breast, and back, and of good carriage and muscular, he will be fit to go into the prize list. Shape is the great point, for a badly shaped bird should stand no chance, and this cannot be told except by handling the bird, so that *no judge* will have done his duty until he has taken all the likely birds in his hands. Even then a person of experience is required to discriminate, for we often see birds with alien blood winning prizes at shows under incompetent judges. Feathery, fluffy Dorking types, and crosses with the modern Game, cannot be too carefully shunned by the judges. The great fear is that this grand breed may be again spoiled by exhibitors in a few years, by breeding to purely fancy points, until it becomes another edition of modern Game, though bred on different lines. Let us remember that while the exhibitors were evolving from the same breed the modern Game, the old cockers, by judicious in-breeding, retained not only the Old English Game, but all its fine table qualities, its laying properties, and hardihood. They bred for purity of blood, shape, activity, hardihood, strength, and gameness, and it will be a standing disgrace if exhibitors allow themselves to lose all these useful points in breeding for the exhibition pen, and in seeking to improve upon a breed that was in its perfection nearly a century ago, and bred to a standard we can scarcely hope to attain to nowadays."

We fear that whenever cock-fighting shall *entirely* die out, it will be impossible to avoid some change in the type of the Old English Game fowl, which was only produced by severe competitive selection. As the fowl is bred for table use, for instance, size must tend somewhat to increase; and in the absence of test by combat, power of wing must tend to decrease. In 1872 we remember publishing the fact that a cock of Coath's strain, about 4½ lbs., *flew* from Lower Langdon to Higher Langdon Farm (half a mile) and there killed the master bird of that farm; and the late Mr. John Harris of Liskeard told us that years ago, when the late Col. Trevor Dickens* came to see him, he called over a hundred cockerels then running under an old cock, from across the valley, and they came flying over the trees like a flock of rooks. We do not think many of the modern birds weighing 5 lbs. to 6 lbs. would have either length or power of wing for such feats as these. Such changes are inevitable, but care may at least be taken to guard against departure from main proportion, and to exhibit birds with firm flesh and good feather and symmetry, and not too fat, as we have been sorry to see on several occasions.

It is also to be desired that there should be no attempt to introduce into the judging of the principal colours those artificial niceties of colour and marking, which long ago necessitated the "double-mating" system in the exhibition varieties. All the colours in the Old English Game fowl were true self-contained varieties, recognised in the natural colour relation of the two sexes, and breeding both alike true to feather. Once this principle is departed from, the seeds of future mischief are sown; for artificial shades of colour are given a prominence that cannot be given without ruin to the breed itself. Next to the care for true type, nothing is more vital to the preservation of this noble race of fowls than the maintenance of such natural sex-relations in colour as is implied by single-mating.

The Standard of Perfection for Old English Game, framed upon that adopted by the Club, and merely reduced by the Poultry Club to its own form of expression, is in one or two points perhaps open to exception; for instance, it surely cannot be right to allow red eyes in Black Game. It is as follows:—

STANDARD FOR OLD ENGLISH GAME

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Medium length, and tapering. *Beak:* Slightly curved and strong at base. *Eyes:* Large, bright, and prominent, full of expression, and alike in colour. *Comb:* Single, small, upright, of fine texture, and evenly serrated at its edge. *Face:* Of fine texture. *Ear-lobes and Wattles:* Fine and small to match the comb as nearly as possible. (NOTE.—It is customary to exhibit Game cocks after being dubbed—*i.e.* having their comb, ear-lobes, and wattles removed, and leaving the head and lower jaw smooth and free from ridges.)

Neck.—Long, and very strong at the junction with the body, furnished with long and wiry feathers covering the shoulders.

Body.—*Breast:* Broad and well developed. *Back:* Short and flat, tapering to the tail. *Shoulders:* Broad. *Wings:* Long, full, and round, inclining to meet under the tail, amply protecting the thighs, and furnished with hard quills.

Tail.—Sickle feathers abundant, broad, curved main feathers with hard and strong quills, and carried well up, but not of the "squirrel" type.

Legs and Feet.—*Legs:* Thighs short, thick, and muscular, well set and held wide apart; shanks of medium length, finely and evenly scaled, and round, not fat on shin, with the spur set low. *Toes :* Four on each foot, long, clean, even, and spreading, the back toe standing well backward and flat on the ground.

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* In the 'sixties this gentleman wrote largely upon this fowl under the *nom-de-plume* of "Newmarket."

Carriage.—Bold and sprightly, the movements quick and graceful, as if ready for any emergency.

Weight.—5 lb. to 6 lb.

Plumage.—Hard and glossy.

Handling.—Firm flesh, but corky and light, with plenty of muscle and strong contraction of the hips and legs.

HEN

With the exception that the *Tail* is inclined to fan shape, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—4 lb. to 5 lb.

COLOUR

THE BLACK

Beak : Dark. *Eyes, Comb, Face, Wattles, and Ear-lobes :* Red or dark. *Legs :* Sound self colour.

Plumage.—Glossy black throughout.

THE BRASSY-WINGED

With the exception of a little dark lemon on the shoulders of the cock, the variety is similar to the Black-Breasted Red.

THE SILVER DUCKWING

Beak : In character with legs. *Eyes :* Red. *Comb, Face, Wattles, and Ear-lobes :* Red. *Legs and Feet :* Blue, olive, white, or yellow.

Plumage of the Cock.—*Hackles, Back, and Shoulders :* Silver, free from dark streaks. *Breast and Thighs :* Black. *Wings :* Bows, silver white ; bar, steel blue ; secondaries, white on outer web, black on inner web, the white alone showing when the wings are closed ; primaries and ends, black. *Tail :* Black.

Plumage of the Hen.—*Hackle :* Silver, striped with black. *Breast and Thighs :* Pale fawn. *Back and Wings :* Dark grey. *Tail :* Grey and black.

THE RED PILE

Beak : In character with legs. *Eyes :* Bright red. *Comb, Face, Wattles, and Ear-lobes :* Brilliant red. *Legs and Feet :* White, yellow, or willow.

Plumage of the Cock.—*Hackles :* Orange-red or chestnut red. *Back and Shoulders :* Deep red. *Wings :* Secondaries, bay on the outer web and white on the inner web, the bay alone showing when the wings are closed. *Remainder of Plumage :* White.

Plumage of the Hen.—*Hackle :* Light chestnut. *Breast and Thighs :* Chestnut, with a light shade towards the thighs. *Remainder of Plumage :* White.

THE BLACK-BREASTED RED

Beak : In character with legs. *Eyes :* Red. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Any sound self colour. (NOTE.—In white-legged birds, daw eyes, and white showing in flights and tail, are not to be considered a disqualification.)

Plumage of the Cock.—*Hackles :* Orange-red, free from dark feathers. *Back and shoulders :* Deep red. *Wings :* Deep red, with a rich dark blue bar across ; secondaries, bay ; primaries, ends black. *Remainder of Plumage :* Black, with lustrous green gloss.

Plumage of the Hen (Partridge).—*Hackle :* Golden red, streaked with black. *Back and Wings :* Partridge. *Breast and Thighs :* Shaded salmon. *Tail :* Black, shaded with brown.

THE BRIGHT OR GINGER RED

Beak, Eyes, Comb, Face, Wattles, Ear-lobes, Legs, and Feet : See notes on the Black-Breasted Red.

Plumage of the Cock.—*Hackles :* Light golden red, free from streaks. *Back and Shoulders :* Bright red. *Wings :* As in the Black-Breasted Red. *Remainder of Plumage :* Black, shaded with brown.

Plumage of the Hen.—*Hackle :* Golden red, black streaks not to be considered a disqualification. *Breast and Thighs :* Light wheaten. *Back and Wings :* Dark wheaten. *Tail :* Black, with a shading of brown.

THE BROWN RED

Beak : Dark horn. *Eyes :* Dark. *Comb, Face, Wattles, and Ear-lobes :* Red. *Legs and Feet :* Dark.

Plumage of the Cock.—*Hackles :* Orange-red, streaked with black. *Back and Shoulders :* Dark red. *Breast and Thighs :* Black, marked with brown. *Wings :* Dark brown or black. *Tail :* Black.

Plumage of the Hen.—*Hackle :* Black, striped or shaded golden. *Remainder of Plumage :* Black, or of a uniform brown mottle.

THE SPANGLED

Beak : In character with legs. *Eyes :* Red or daw. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Self colour or mottle.

Plumage.—Either black, blue, buff, or red, with white spangles, the marking to be as even as possible. *Tail :* Black and white.

THE WHITE

Beak : Yellow. *Eyes :* Red or pearl. *Comb, Face, Wattles, and Ear-lobes :* Scarlet red. *Legs and Feet :* White or yellow.

Plumage.—Pure white throughout.

OTHER VARIETIES

Among other varieties recognised are Hennies, Muffs, and Tassels in all colours ; Furnesses, Polecats, Black-breasted Crow-winged Reds, Blue, Red, and Yellow Duns, Blue and Yellow Piles, Yellow, Brown, Streaky, and Marble-breasted Duckwings, and Birchen Greys.

SCALE OF POINTS

Feet, 9 ; shanks, 6 ; thighs, 4 ; spurs, 2 ..	21
Breast and body, 12 ; back, 8	20
Eyes, 6 ; head, 4 ; beak, 4	14
Carriage	10
Colour	8
Handling	8
Plumage	7
Neck	6
Wings	6
	100

Serious defects : Crooked or humped back ; crooked breast-bone ; wry tail ; flat shins ; duck feet ; bad carriage ; rotten plumage ; or any unsoundness.

CHAPTER XXIII.

THE EXHIBITION GAME FOWL.

PRECEDING pages have already presented many striking examples of the changes which may be caused by judging, and fashion, and breeding, in the form or type of even the purest races of poultry; but perhaps there is no case in which such changes are so conspicuously evident as in the subject of this chapter. There is no doubt at all as to the origin of the modern exhibition Game fowl. When cock-fighting became illegal, and poultry shows were in their early popularity, the very same fowls that had been bred for fighting in the pit, were placed in the exhibition pens. The Old English Game fowl of the preceding chapter, was also the exhibition Game fowl as known at that day. The colours shown were the same colours, and the fowls were the same fowls; and it was, in point of fact, not at all unusual for the many who still occasionally practised cocking on the quiet, to exhibit birds which had fought, or to fight birds which had been shown with success. And so long as exhibition was chiefly confined to the old school of Game breeders, the birds continued to be shown with but little change.

Development of the Exhibition Game Fowl.

But as Game fowls began to be shown more and more by persons who never fought them nor dreamed of ever doing so, change inevitably crept in, from causes fully explained in the earlier chapters of this work. Judging, as well as breeding, no longer remained in the hands of the old cockers, and details of mere appearance began to be more studied, both in regard to colour and form. In regard to both points, change at first was very moderate, and it crept in gradually, by insensible degrees. Exhibitors and judges understood that the Game fowl was different somehow from the breeds which were often termed in comparison the "heavy cart horse style"; the tendency was natural to prefer somewhat the taller and more reachy birds; and to a certain extent the modified type did, especially while confined to the earlier and more moderate degree, appeal to even the general public with a beauty of its own, and was welcomed by many for the very reason that it *was* somewhat distinct from the original cock-fighting model. The following remarks, written by the late Mr. John Douglas, who exhibited many winners both for himself and for the Duke of Newcastle, for the first edition of *The Illustrated Book of Poultry*, are well worth quoting as evidence of what had taken place up to that time, and how far change had then proceeded:—

> I am very sorry to see every now and then some novice or old antiquated breeder stating that the Game fowl has deteriorated within this last fifteen or twenty years. I myself have kept Game for about forty years; and when lawful to fight cocks have carried my Game cock to school to fight, and many is the three days' fighting I have seen in the town-hall, with magistrates for the principals; and I have even myself, when a boy, had a cock-fight with the head magistrate's cock, and won. Many is the main I have seen between one end of the town and the other; also town against town, and two or three battles a week the whole winter through. At night, after a hunt day, I have seen many a battle for more money that I should like to name. In those days we studied nothing but the blood. So the cock was "game," we neither looked for symmetry nor beauty of plumage; but still, at the same time, when we did happen to get a nice symmetrical bird, we prided ourselves on him greatly, and seldom but he turned out a "clipper" in the pit. The main point is a firmness of flesh and great muscular power, with the least lumber; and many of our present exhibitors have often heard remarked from those who still often see birds in the pit, "What a nice, commanding, 'reachy' cock!—not one of the thick clumsy louts; but nice and springy, and fit to fight for his life!" Those who keep harping on the point that our Game fowls are not so good as they were, should tell us in what points they are not so good. They say they do not want them for the pit, and never saw a fight, nor do they want to see one; what then *do* they want?
>
> For my own part I consider there has been more improvement in the Game fowl than in any fowl we have within the last thirty years, if we place perfection in beauty, symmetry, purity of feather, more muscle, less but stronger bone, and more hardness of flesh. I consider we have discarded cumbersome flesh laid on where not wanted, got more muscle, more symmetry, purity of feather, and everything more pleasing to the eye. I cannot understand what people want. There is the "game" in them now, that will stand to be cut up if wanted; though sorry should I be to have to witness a grand and beautiful bird disfigured for that purpose. In the fields or yards, however, the Game cock is just as vigilant and fearless as he was thirty years ago; and hens at the present day are just as

demonstrative and careful of their broods. So where do they see the "want of game"? Those people, I am sure, are unsuccessful exhibitors; but if they would follow the advice of those who are successful, there would be none of this ridiculous nonsense about Game deteriorating, when it is far otherwise.

But changes of this kind, when once fairly initiated, could not stop at the point reached when Mr. Douglas wrote the above in 1872. So soon as fanciers and judges began to look specially for height and reach and colour, it was inevitable that they should seek to get more of these points; and they did so. The process and the gradual development by it of the present Exhibition Game fowl are so interesting and instructive, that we have asked Mr. Ludlow to prepare in illustration of it the three sketches shown in Fig. 115. The centre figure represents the bird in its transition stage, at the time when the above sentences were written, the outline being an exact reproduction on a reduced scale of Mr. Douglas's Black-breasted Red cock, "The Earl," winner of the cup at the Crystal Palace in 1870, which formed the frontispiece to the first edition of *The Illustrated Book of Poultry*. This bird was painted in oil by another artist, as well as by Mr. Ludlow; and having seen and compared both paintings, we select it as an absolutely authentic contemporary record of the time. The other two outlines are sketched from Old English Game, as representing the original type, and from an exhibition bird of the present day.

Gradual Change in Type.

It will at once be seen that the Game fowl of 1870, as here reproduced, was in a transitional state of development in regard to other points than height or reach. The powerful "boxing" head and beak were already becoming longer and thinner, though not so long and thin as they have become since. The tail has become much closer and more whipped together, though not nearly so much so as afterwards, and still possessing a singular beauty of proportion of its own, especially in regard to the nicely "Venetianed" arrangement of the sickles and side-feathers one over the other. The neck has become more slender, and the hackles shorter and more scanty, though both these changes also are carried much further in the bird of 1900. It is needless to go into more detail, but the diagrams themselves will form an instructive and impressive object-lesson concerning the profound changes which fashion and breeding and judging can effect in one of the oldest breeds of poultry.

The later stages of this transformation were not effected by selection alone. Even in 1872 the Rev. A. G. Brooke, in writing upon Malays, stated the fact of that breed being used as a cross to increase the size and stature of Game for exhibition, and that applications were made to him for birds to serve that purpose. But subsequently the Malay cross was used quite

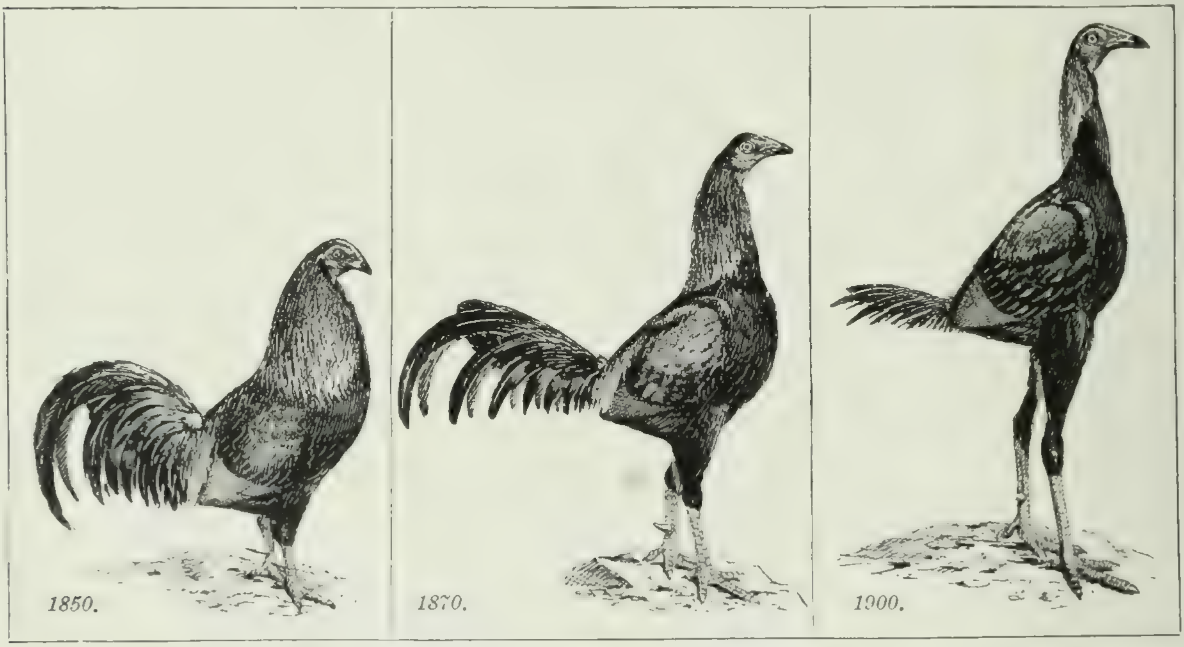
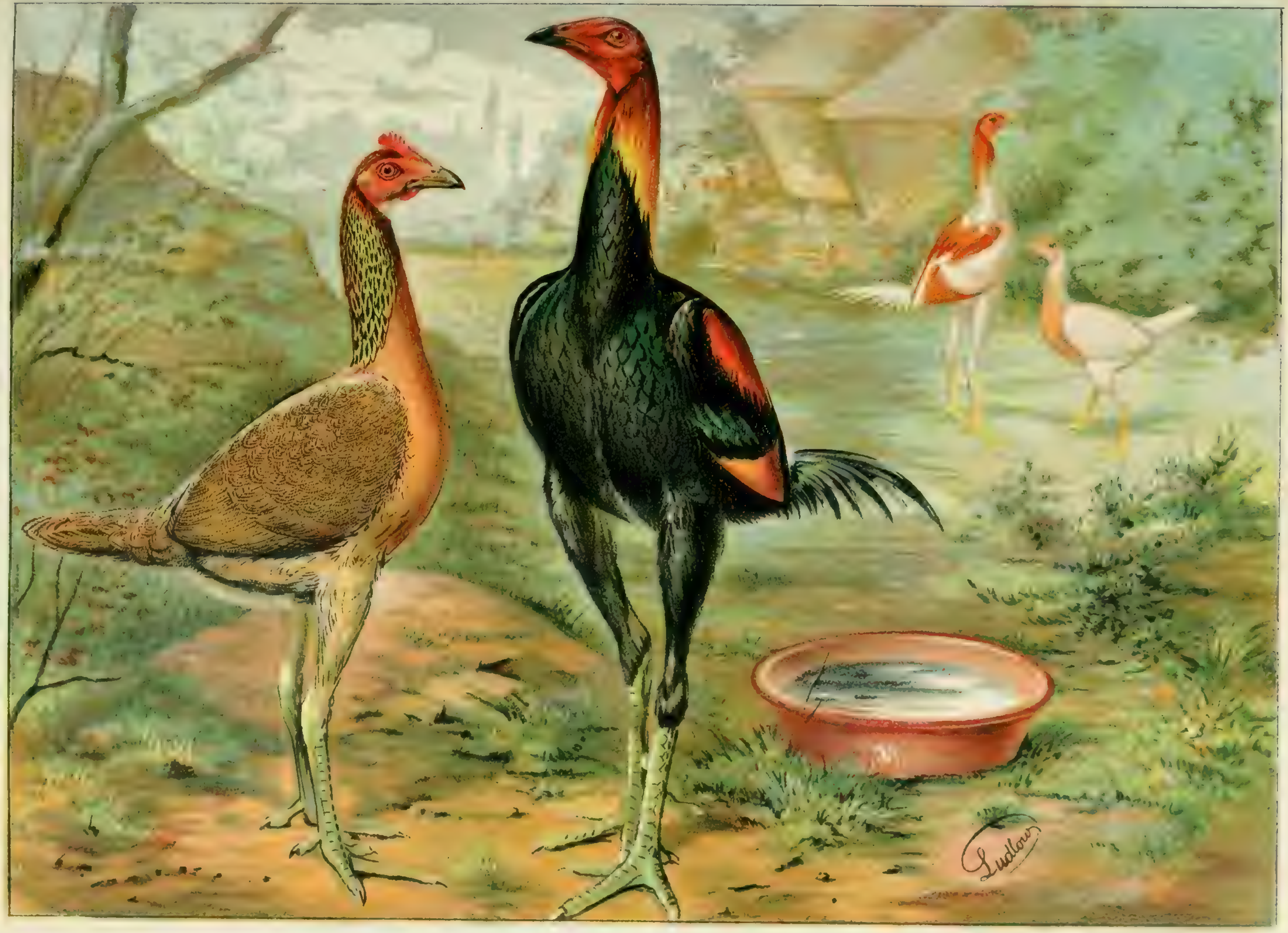


Fig. 115.—Development of Exhibition Game.



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BLACK-BREASTED RED. PILE.

EXHIBITION GAME

extensively by breeders in order to attain greater length of limb, with shorter and harder and more scanty feather. With this cross came at first, of course, very bad heads; but these were very soon bred out, as were other prominent Malay points: there has remained, however, a more sloping back as a rule, and more prominent shoulder-butts than belonged to the old English fowl: also a length of limb that compares with, if it does not even exceed, that of the Malay itself.

Change has not been confined to form alone: it has affected colour also profoundly. At first the birds had been exhibited in their natural colours, in natural sex-relation. In Black-breasted Reds, for instance, the darker red cocks and the rich partridge hens appeared, as they were bred from single-mating in the old Derby and other strains; but the brighter colours were preferred, and very soon the bright red cocks and light partridge hens were found to breed brighter and better from double-matings. So also the Brown-breasted Reds began as really brown-breasted birds; but preference for bright colour and precise lacing gradually produced a new colour containing only black and lemon, with no brown in the breast at all. It is, however, unnecessary to discuss this phase of the matter further. As has already been shown, the change has in the end been so great as to create a reaction in favour of the older breed, which has again returned to popularity, now as an entirely distinct and different type. But it is remarkable that while the general public unmistakably recognise greater beauty in the old Game fowl, the points of the modern show bird also possess a peculiar fascination for those who can understand them, and call forth in them an enthusiasm which is scarcely paralleled in any other breed. Birds have frequently changed hands for as much as £100, which can probably not be said of any variety beside; and the competition at Birmingham Show, which in Game fowls is the recognised great event of the year, evokes a kind and degree of interest amongst the circle of breeders, which in its way is unique.

The development of the exhibition type of Game fowl has to all intents and purposes excluded from this department of competition many colours and markings formerly shown, and which are still to be found in classes for the Old English breed already treated of; and the present recognised varieties are now comparatively few and well defined. The chief are those known as Black-breasted Reds, Brown Reds, Duckwings, and Piles; of any others occasionally shown, very brief mention will suffice.

Black-breasted Red Game.

The Black-breasted Red has always been the acknowledged head and type of all Game fowls. One reason for its prevalence, is no doubt that the colour most closely resembles that of the wild jungle-fowl (*Gallus bankiva*) believed by most naturalists to have been the original of either all or most of the domestic breeds of poultry; hence when birds were bred with less reference to shades of colour than now, it tended to prevail. Originally, as briefly hinted above, the natural sex-colours were exhibited; cocks being shown with darker hackles than now, and hens of a rich partridge with shades of red on the wings. But both judges and breeders soon began to show marked preference for the clearer and brighter shades in both sexes, until practically only bright and light-coloured specimens are shown with success in first-class competition, though occasionally a somewhat darker bird may win by reason of very superior shape and condition of feather.

The following description of the Black-breasted Red Game as now demanded for the show-pen, is kindly contributed by Mr. F. C. Tomkins, of Brimfield Court, Herefordshire, well known as a breeder, exhibitor, and judge; and in regard to the first portion of it, may serve also for other varieties, as a description of the exhibition type of bird in general:—

"In describing as requested the Black-breasted Red Game fowl, the following is my own ideal, and will be generally accepted by the fancy at large. The description may with advantage be divided under two separate heads, viz. style, or shape and make, and colour.

"We will take the style of the cock first. The beak should be long, strong, and slightly curved; the head long and rather narrow; the eye bright red, prominent, bold, and fearless: in fact the head should bear a sort of snaky expression. The neck to be long, shoulders broad, back short and quite flat, wings carried well up and close to the body. The tail to be short, carried rather low, with short fine-pointed sickles. The legs should be long, but by no means to have a stilty appearance; the thighs to be slightly curved, and the shanks nicely rounded and fine at the hock-joint; the legs to be set well apart, the feet flat, and the toes long; the hind toe to point straight backwards, and be as close to the ground as possible: this last is a most important point. A Game cock should be a combination of quality and substance, in fact be like a race-horse with plenty of bone.

"The style of the hen is similar, her beak also being long and strong and nicely curved; comb small, upright, and evenly serrated; head long and rather narrow, eye bold, red, and prominent, with a keen snaky expression. The neck should be long, thin, and fine at the throat, shoulders broad, back short and flat, tail close and carried rather low, wings short and carried close to the sides, legs long but in no way stilty, thighs nicely carried, shanks smooth and well rounded, feet and legs generally as in the cock.

"We come now to the colour of the cock. The beak should be dark horn. Head and neck hackle a light orange red, free from black stripes. Back, wing-bow, and saddle a rich crimson, the saddle hackles always running a shade lighter. Secondary flight feathers a bright rich bay; wing-bar a green glossy black; shoulders, breast, thighs, and tail a sound black; legs willow. When this very bright top-colour as here described is produced, there is a tendency for the breast, hocks, and fluff to become ticked or laced with red. This is a very grave defect indeed, and of the two evils I would much rather tolerate a shade darker in top-colour, to have the breast, hocks, and fluff absolutely black. Of course the bright top-colour and a sound black can be and are produced together, but it requires great care in the mating, and a thorough knowledge of the pedigree of the birds mated.

"The colour of the hen is as follows: Head a clear gold; neck hackle gold, slightly striped with black, but running to clear gold on top of the head. The breast should be a rich salmon, running off to an ashy colour on the thighs. Back and wings a light partridge with *very small* and fine markings, with a slight golden tinge pervading the whole. This should be quite even throughout, free from ruddiness or shaftiness on the sides, and no large coarse pencillings on the flight feathers of the wings. The tail is black except the top feathers, which should match the body colour.

"With respect to the mating of Black-Reds, separate pens are required for cockerel- and pullet-breeding. For cockerel-breeding a cock such as above described should be used, and for pullet-breeding hens of the standard colour must be used. It is, in my opinion, useless to describe the colour of hens to be used for cockerel-breeding, or the colour of cocks required for pullet-breeding, unless we know *how* they are bred, as the produce might be quite different."

Breeding Black-Red Game.

The following description, and notes on mating for the production of this variety, are by Mr. Samuel Matthew, of Haughley, near Stowmarket. This gentleman was a well-known breeder of Game for over sixty years, and rarely failed to get near the top, until he had the misfortune to lose nearly all his best birds by foxes: it will still be remembered how he bred a cock claimed at the Palace in 1884 for £100, and which won the £50 cup at the Birmingham show following; and that the following year another bird, a half-brother to the one just mentioned, was claimed at Birmingham for a hundred guineas.

"The Black-breasted Red cock of the present day should be as follows for the show-pen, and for breeding exhibition birds the same points should, of course, be looked for with especial care: The head to be long, thin, and bony, well set on the neck, with beak also well set on, and in no way parrot-beaked. The eyes large, full and bright, red or roach-eyed, and whole face lean and thin, showing what is called quality. Neck to be long and slightly arched, tapering neatly from head to shoulders; hackle short, close, and swinging back. The back flat, broad at shoulders and tapering to the stern; body short, and well cut up behind; wings powerful; neither carried on the back nor yet low on the thigh. The thighs to be long and muscular, standing clear out from the body: shanks round, not flat, with very fine scales; the foot large and flat, with well-spread toes, back toe to stand well out behind. The plumage all over short; on top a very bright or orange red, especially the hackle and saddle, which must be quite free from black stripe or pencilling; breast, body, and stern perfectly black; tail lustrous black, with narrow sickles, well pointed, about eleven inches in length; the lesser sickles or side-feathers should be also narrow and well pointed, about five in number on each side of tail, each getting shorter as it approaches the root of tail, all being well whipped together. Legs and feet willow, carriage erect, alert, and fearless, weight about 6½ lbs.

"For breeding cocks of this description, such a bird will of course be the sire: I will now give the points of the hen to be mated with him. Her general characteristics will be those of other Game hens, the head being long and bony, with beak standing out well, face and eye red, also comb, ear-lobes, and wattles. Attention should, however, be given to the comb: it must be small, fine, and well serrated, not becoming at all lopped even when she is laying. The hackles are nearly a lemon, pencilled in the centre. Her breast should be a light salmon, lighter towards the stern and down the thighs; the back somewhat of a stone-colour, the minute black partridge marking being on a grey ground with scarcely any brown in it; wing-coverts and secondaries of a light brown colour and evenly pencilled; shanks and feet willow. Her tail should be carried low, and be somewhat short and well whipped together, in order to breed these points in the cockerels. It is almost unnecessary to say that such a hen should be of the same blood as exhibition cockerels, reliance not being placed upon colour alone if it can possibly be helped.

"We come next to the exhibition pullet. In shape and general points she will resemble that just described. Her head and neck hackle are golden, as free from black as possible: the breast salmon, running off to more ashy colour on the thighs; body a light partridge, not coarsely pencilled on the wings nor at all mossy in flights: the back and sides even in colour throughout.

"Such birds being chosen as the mothers, I will now describe the colour of the cock required in order to breed pullets fit for the show-pen; in build and style he will, of course, resemble the exhibition bird already described. But his top-colour, that is especially his hackle and saddle, is quite different, being quite a bright lemon, so as to appear almost washy. Cockerels of this colour, of course bred from pullet-breeding strains, are now used by most of our principal breeders to produce the pullets that win at the leading shows; but they are not themselves good enough to win in high competition. The pullets themselves also very seldom produce a good cock, though you may get one now and then by chance. Thus it will be seen that for breeding Black-breasted Red Game successfully, two pens, or what is called double-mating, must now be used.

"Some breeders also employ for pullet-breeding cocks that are marked with brown on breast, wing-butts, and rump. By putting such a bird to good pullets or hens, they often obtain very good-coloured pullets for the show-pen; but not only are the cockerels useless for showing, but hens or pullets bred in this way prove most disappointing if it is attempted to breed cockerels from them, as many amateurs have proved to their cost. This mating also produces more wasters than that first described.

"I do not believe in now crossing either of the above colours in cocks with Wheaten hens, having tried this mating with no good results. But the first described, or exhibition cock, is well adapted for breeding exhibition Pile cocks, when crossed with a good yellow-legged, pale-coloured Pile hen: the pullets will be useless, as they will be willow-legged. And the second colour described, the pullet-breeding cock, is well adapted to cross for Duckwings; if put to a clear-winged good Duckwing hen, the produce will generally be a well-marked Duckwing cock."

The matings here described, it will be seen, represent established cockerel-breeding and pullet-breeding strains. Other matings, as described years ago by the late Mr. John Douglas and Mr. W. F. Entwisle, are still occasionally used by breeders with more or less success. They depended on the use of somewhat *darker* cocks, almost bay in the hackle, with often a little black stripe in it, and lighter shades of partridge hens, the lighter of which in part resemble the cockerel-breeding hen or pullet described above. At that time, however, the exhibition colour of hens was a perceptibly darker partridge than it is now. Hence it was often found that a bright exhibition cockerel mated with exhibition hens produced good pullets of the rather darker colour then shown, and such birds are still successful occasionally by reason of excellence in feather and style. The exhibition cockerel was also mated with the lighter shades of pullets to breed cockerels; but the pullets were rarely dark enough, and hence this mating was already on the way to that described by Mr. Matthew. The darker cocks just mentioned were mated with medium or rather light-coloured hens, often producing rich partridge pullets; and sometimes with a very light hen, or a Wheaten, they would breed bright rich cockerels. But the final preference for bright colour in both sexes, has made these old matings difficult and uncertain, though some fine individual bird may occasionally make such an experiment well worth while.

It is almost unnecessary to state that in any of the matings here described, as in all other poultry breeding for points of plumage, an all-important matter is the *pedigree* of the birds. Two pullets of apparently similar plumage, but of different breeding, might produce very different progeny from the same cockerel. To mate carefully by choice of colours alone, is better than to mate carelessly, and from necessity it may have to be done sometimes, for want of other information about some bird that promises too well to be passed over. But the breeder's sheet-anchor is pedigree, and the knowledge that the bird he has chosen is of the proper cockerel-breeding or pullet-breeding strain. This will apply to all the other varieties.

Brown-Red Game.

The next principal colour in modern Game shows perhaps the most remarkable transformation of any, in consequence of selective breeding and judging. The division was once known as Brown-breasted Red Game, and the name was perfectly accurate, the breasts of the cocks being either brown, or brown mingled with black, or at least brown or bay streaks upon the black, somewhat like the breast of a starling; while the top colour contained much red, ranging from orange-red to crimson. The catalogue of the Birmingham show now describes the present colour as simply brown-red, omitting all definite allusion to the breast, probably as being absurd; but in point of fact the colour can now scarcely be said to be marked by either brown or red anywhere, and, indeed, any conspicuous signs of either would be fatal to success. The process of change can be pretty easily traced. Up to the time when Mr. Douglas wrote in 1872, the most popular colour in cocks was streaky or starling-breasted, with a bay streak to each feather, and red and crimson top-colour; but there was also already recognised as a favourite colour, a black breast with narrow lacings of bay, and top-colour of a lighter orange-red and crimson, running off in places to rich orange-lemon, and hens black all over except striped golden hackles. This marking steadily elbowed out the other; and then as brighter colour was preferred, the bay lacing was replaced by rich orange, and this by rich lemon, and finally by bright light lemon, which extended to the hen's breast also. Glossy green-black was also demanded, until finally we have a variety in which practically the only colours deemed admissible are rich green-black and lemon, though from old association and origin still termed brown-red.

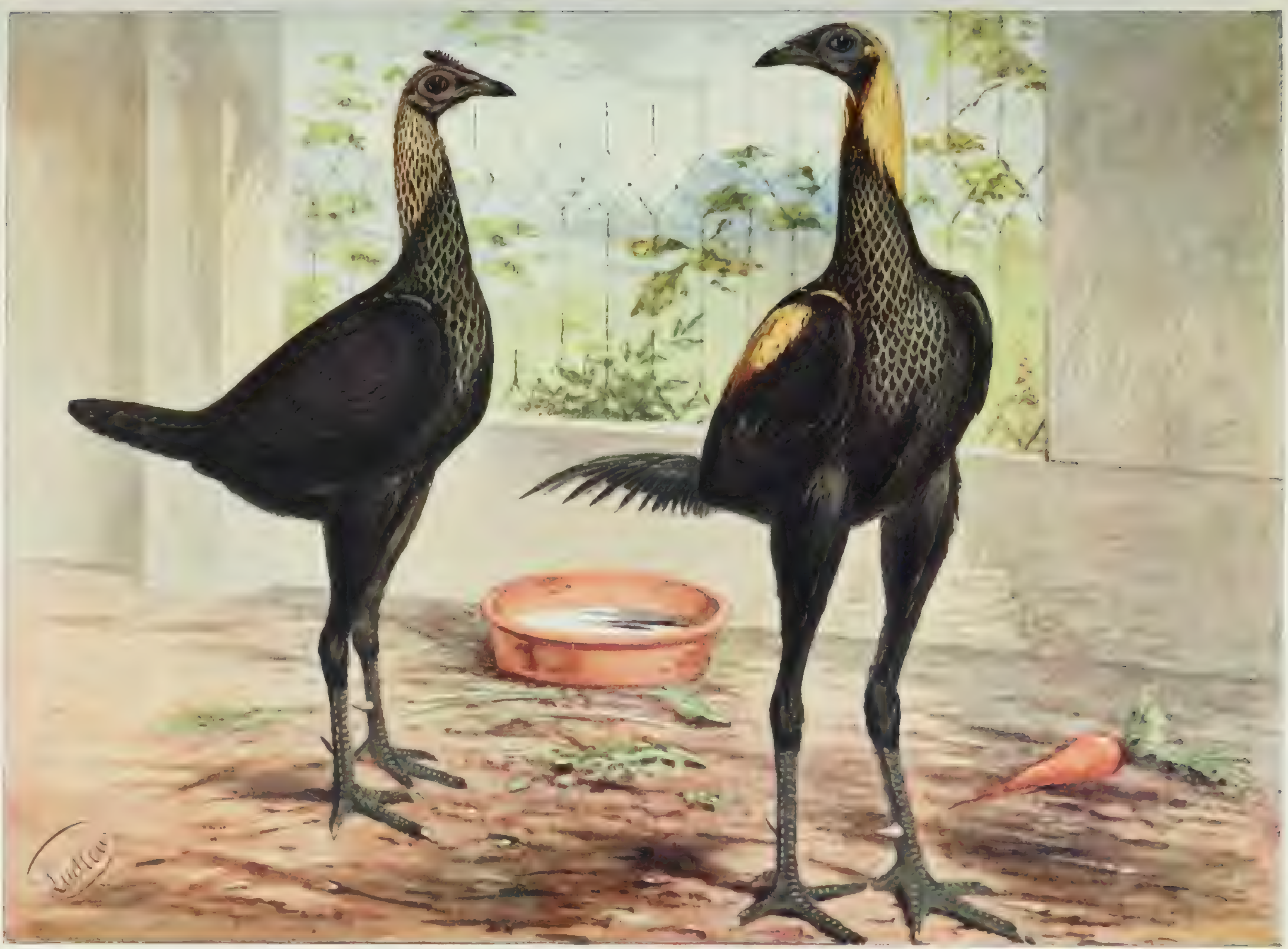
The following notes upon this beautiful variety, and its breeding for exhibition, were kindly contributed by Mr. Frederick Wardle Smith, Kingston House, Carlton, near Worksop:—

"To form a strain of Brown-breasted Red Game, and to breed them with any hope of success, takes several years of careful observation, selection, and management. Let no beginner think he can purchase a few winning birds, however good they may be, and find himself in the first flight the following show season. Brown-Reds will not breed true to colour from what is generally known as a single mating. For instance, a perfect lemon exhibition cock mated with a bright-hackled exhibition hen, will often throw a large proportion of grey chickens, which are, of course, worthless. But before dealing with the breeding of Brown-Reds, I will describe the correct type and colour of exhibition birds.

"In both sexes the head should be long and lean, the beak strong and slightly curved, the eye large, and free from the heavy overhanging brow. The neck should be long and thin, and well cleaned out at the throat; the back short and flat, broadest across the shoulders, and tapering towards the tail. The shoulders should be broad, prominent, carried well up, and slightly away from the body; the wings short, the flights carried under the saddle feathers, and well nipped into the body behind the thighs. The breast should be broad and firm, and the breast-bone short, and curved like the keel of a boat. There should be no lumber or heaviness in the under part of body behind the thighs. There the bird should be fine, and well cut off to the root of the tail. The thighs should be long and muscular, set well apart, and the shanks round in front, smooth, and rather shorter than the thighs; the hocks neat and clean-jointed; the feet large and fine, toes well spread, and the back toes set on low down and carried straight back. The tail should be small, short, fine, and straight, carried tight, and slightly above the horizontal line. In cocks the sickles should be slightly curved, narrow, and pointed, and a little longer than the hen's tail. The secondaries and tail coverts should also be fine and pointed. The thighs should be set in the middle of the body, so as to give the bird a firm, well-balanced appearance. Nothing is more objectionable than thighs set too far forward; this always makes the bird look stilty and ungainly. The whole appearance of the bird should be tall, bold, springy, and hard. The feather should be short and hard, and in the hackle and saddle of the cock, fine, wiry, and pointed.

"In both sexes the colour of the eyes should be black; the face and comb dark purple-black, or as black as possible; the beak and nails the darkest horn colour or black (old birds, as a rule, go light in the colour of the leg). The comb of the hen should be small, fine, and evenly serrated.

"The colour of the exhibition Brown-red cock should be as follows: Head, hackle, back, saddle, and wing-bow pure bright lemon; the hackle striped towards the bottom of the neck with black, the back and saddle feathers being black at the base, and sharply defined (Fig. 116). The rest of the body and tail black, except the breast, which should have each feather laced at the edge with short, round (not



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BROWN RED GAME

pointed) lemon lacing. The shaft of every feather black. The lacing should extend from the throat to the junction of the thigh with the body. The sheen, a most important point, must be a brilliant green. In the hen the hackle should be pure bright lemon, with the centre and shaft of each feather black, the lemon colour running well on to the top of the head. The breast laced similarly to the cock's. The rest of the body and tail black, with a brilliant green sheen.

"The chief faults to be avoided in Brown-red cocks are long backs, bad eyes, thick necks, and long feather. Cocks showing a darker shade of colour on the wing-bow than on the back should be carefully avoided. In hens the most common faults are long backs, bad eyes, soft feather, and coarse tails. Purple or bronze sheen, or dull body colour, in either cocks or hens, cannot be too strongly condemned.

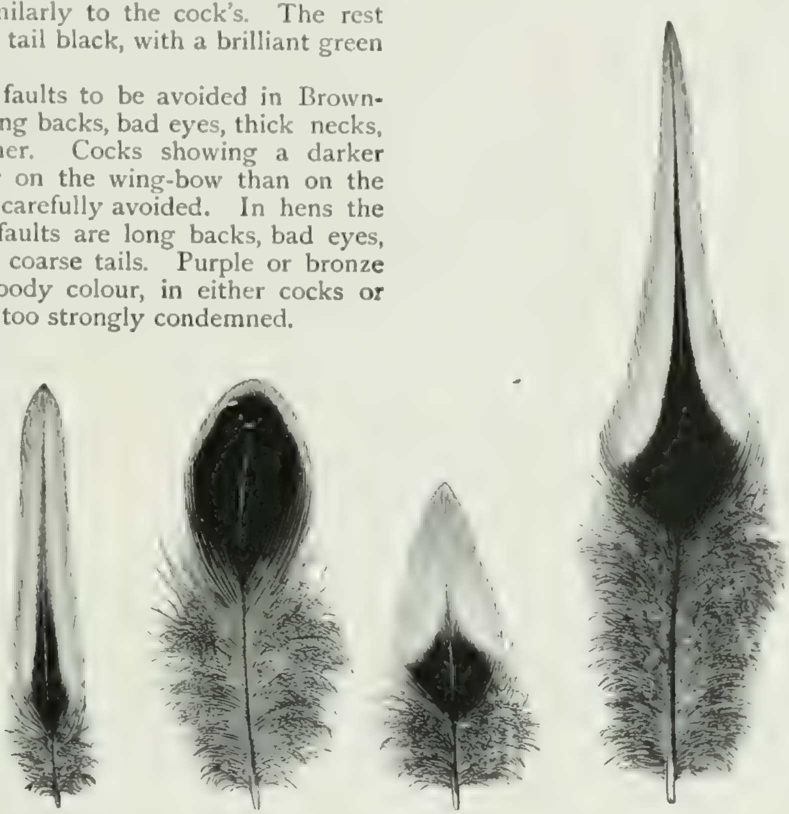

Hackle. Breast. Back. Saddle.

Fig. 116.—Feathers of Brown-red Cock.

Breeding Brown-Red Game.

"To produce exhibition cocks, a perfectly coloured cock should be mated with hens rather short of breast lacing, or with hens that show a lot of black in the hackle. A capped hen (that is, a hen with the feathers on the head black instead of lemon) will also often produce good cockerels, but not pullets, when mated with an exhibition cock. Good cockerels may also be had by mating hens with too much breast lacing, or with lacing on the back and sides, with a cock rather darker in colour than an exhibition cock, but he must also have very little lacing, and be short and hard in feather.

"Pullets for the show pen may be bred from exhibition hens, and a cock of a rather darker shade of colour than a show cock. The cock must be very sound and glossy in his black, especially in his thighs and belly, and must not be overdone with lacing. His hackle also must be perfectly even in colour from the top of his head to the bottom of his neck. An exhibition cock mated with very glossy-bodied hens, with hackles rather too dark for the show pen, will also produce good pullets, and occasionally a good cockerel. This therefore is some approach to a single mating.

"Of course many birds will be bred with brownish bodies, bad eyes, crooked breasts, in-knees, etc. These should be disposed of at once. Avoid breeding from coarse sickled cocks, any birds having flat shins, or possessing any other deformity. Always choose cocks full of quality and of a pure, sound, even colour, whether light or dark in shade; and never breed from a cock having a pale washy-coloured back and a dark wing bow. Above all things, *never* cross Brown-reds with Birchens or Duckwings. Much has been said about the beautiful pure lemon colour being produced by such a cross, but it is not the case. A Brown-red cock produced by a Duckwing or Birchen cross, is always dull in body colour, and has a washed-out look in the hackle, back, saddle, and wing-bow. Other birds from this cross come a reddish white in colour, where they should be lemon. The hens also are dull in body-colour, with dirty brownish hackles. Always breed from the glossiest and purest-coloured birds.

"The secret of breeding Brown-reds is to thoroughly master the difference in the various shades of colour, and to know the *exact pedigree* of the breeding stock. No breed of Game fowl requires such careful mating to produce show birds as the Brown-breasted Reds. There is the gipsy face and breast lacing, which breeders of the other varieties (except Birchens) have not to contend with; but when an approximately perfect exhibition bird is produced, there is no variety of fowl that can compare for brilliance of colour and attractiveness with an exhibition Brown-red cock."

Birchen Game.

Somewhat allied to the Brown-red is the Birchen, a colour now recognised at important shows. The foundation of this variety was an old and now almost extinct breed known as Silver Birchen Grey, and by some old breeders as Silver Duckwing, though the latter name properly belonged to another colour presently described. In this the cocks were black-breasted and white-hackled, the hens mostly a dull black, with some indications of lacing on the breast. By crossing this variety with the lightest lemon Brown-reds, lacing was improved and developed in both sexes, until the present Birchens may be described as generally similar to the Brown-reds, but with the lacing and hackles silvery white instead of lemon. The lacing in both sexes is, however, narrower and sharper, and extends farther over and down the breast, giving a very delicate and pleasing effect.

Birchens breed truer from one pen than most varieties of Game, so that a fair proportion of both sexes may often be produced from a single mating, of good pedigree. As a rule, however, better results are obtained by special matings, putting with exhibition birds of the sex desired, mates with a little deficiency in marking, or rather—for this is what it really means—superabundance of black colour, on the general plan described above for Brown-reds. There being in this breed only perfection of marking in clear white, less depends upon selection, and more upon pedigree or breeding of the birds put together, than in most other varieties.

Duckwing Game.

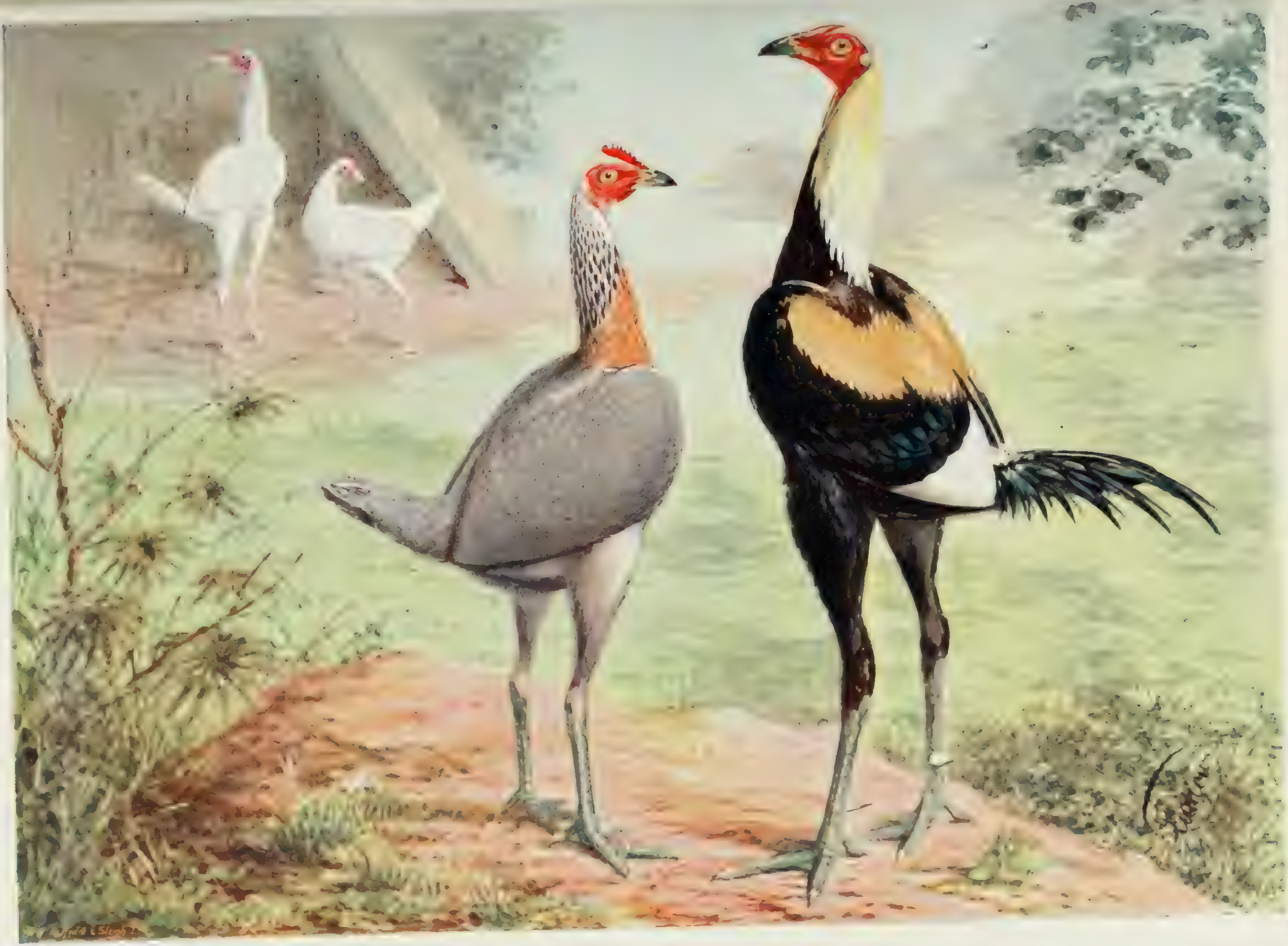
The Duckwing Game is one of the most beautiful varieties. The face should be bright red, with the eye a sound ruby red. The cock's head is creamy white, hackle creamy white or pale straw, the back and saddle orange or gold going off to yellow, wing-bows the same; wing-bay a clear white, free from any red or rustiness; shoulder-butts and all under-parts deep blue-black; wing-bar black, with blue lustre; a blue lustre pervading all the black plumage. The hen's head is silvery white or silvery grey, and neck hackle silvery grey striped with black; her breast salmon, going off to ashy grey at the thighs; back and sides silvery grey minutely pencilled with black or dark steel grey; the upper feathers of her tail should be about the same, the lower feathers black. The hen's plumage resembles that of the Silver-grey Dorking, shown on page 382. This description refers to what are known as Golden Duckwings, which are a more or less compound variety, as explained in the notes which follow. The Silver Duckwings, which are a pure race and can be bred true, very much resemble the Goldens in regard to the hens, which are only a little more pale and silvery, with lighter salmon breasts: but the cocks differ in all the light upper parts of the plumage, being silvery white where the other is yellow. As will be seen, the Silvers are the real foundation of the Duckwings.

For the following notes on mating and breeding Duckwings for exhibition we were indebted to Mr. Arthur Binder, Ecclesfield Common, near Sheffield:—

"The Duckwing is a cross-bred bird, if one can be so named which is obtained by using a Game strain of another colour—the Black-Red. It will be apparent to all that this crossing, with both cocks and hens, offers many opportunities for experimental breeding; and the mating of pure Black-reds, Duckwing-bred Black-reds, Duckwings, and Silver-bred Duckwings, gives rise to never-ending discussion among fanciers. The mating of the various birds here given is the system I usually follow, and is founded on the experience gained during the twenty years I have followed Duckwing breeding in Game fowls.

Breeding Duckwing Game.

"As to choice of stock generally, no new advice can be given. In breeding anything worth the trouble, one must get *the blood*, and one usually has to pay the price for it. But the wideawake buyer spends his £5 or £10 and gets what will do him some good; while the rash novice may spend his £20 and more, to find he



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WHITE GAME

DUCKWING GAME.

has to begin again. The one will perhaps look out for a late-hatched bird, which had not finished growing when winter stopped him, and whose colour, for the same reason, has still to come; will inquire his breeding, and if possible see the parent birds, and will know that—properly mated—he will throw as good stuff as his more fortunate brothers, whose price is four or five times as much. On the other hand, the mere 'long-purse' man, who buys chiefly from exhibition winners, certainly gets something for his money, but unless he is more clever than most, his next year's birds will frequently be no credit to their parents.

"Coming now to discuss the various matings used in breeding Duckwings, we will consider first one only employed for cock-breeding. This mating is that of *a Black-red cock with Duckwing hens.*

"For this mating the cock should be a pure bred Black-red, with no points specially differing from the standard; but note the following: His hackle must be free from stripes, and all one colour. If it is a little dark it is no detriment, provided that the one colour be adhered to. He must also be exceptionally good in his black; and in judging for this, especially notice the shoulder points and fluff. If the black is not sound, the shoulder points of the cockerels will be ticked, and the fluff will have a brownish tint, running to greyish in old birds. His feather should be exceptionally short and hard; because the Duckwings he is to be mated with are inclined to be feathery. His wing-bars should be shaded of purple rather than green. The back colour should be one shade across, of course; but it should certainly not be light, rather of a mahogany cast. Be sure not to have a white stripe up the quill of the sickles, as this will come out in the chickens.

"Now for the Duckwing hens to be mated with the Black-red cock. As a matter of theory, none but sound-coloured hens should be selected; but all breeders know that very few such are to be met with. One finds well-set-up birds with coarse colour, and other defects, but with good qualities that make one hesitate not to use them. Hens, therefore, should be mated with the Black-red cock that are either paler on breast than the standard; or not so pale on breast, but with reddish sides and coarsish wing-ends; or coarse-tailed hens, otherwise good, should be used with the Black-red cock rather than with a Duckwing, because the Black-red will correct this defect more surely than the Duckwing.

"In regard to the produce of this mating, only Golden Duckwing cockerels will be fit for exhibition. The pullets are all Black-red, and being Duckwing-bred are useless for show purposes. They are usually mated with a Duckwing cock. Of the cockerels bred, a bird that is from a coarse-coloured hen should never be mated up again to breed pullets.

"Our next mating will be more or less successful both for cock- and pullet-breeding, and consists of *a Duckwing cock with Duckwing hens.* For this mating the body shape, head, legs (except for colour), tail, and style of the cock should be as in all modern Game. But see that his hackle is creamy without streaks, short and straight; his body-colour golden right across back; bars purple; wing-ends a nice white diamond, free from redness; from saddle to root of the tail the colour gradually going from golden to creamy white, as in hackle; breast, shoulders, and fluff a good sound black; legs willow (may be olive green, but not blue); eye and face red. This last is a great point, because seven out of ten Duckwings have bad eyes at the present time.

"The hens to mate with him, as with the cock, will be similar to all modern Game except for colour. The hackle should be black and white mingled, a light shade preferable to dark if not washy, but must be same shade over top of head to face, capped birds being very objectionable. The body-colour a steel-grey, free from rust or redness, bars and wing-ends as delicate as possible; tail same shade as body, but is generally found a little darker. The breast salmon, free from smut; head, legs, eye, and face same as cock. N.B.—The darker shaded hens should be mated up in this pen: a sound colour of course preferred.

"In regard to the produce of this mating, both cockerels and pullets being pure-bred, will be fit to mate for breeding afterwards in any pen according to colour, and of course for exhibition according to their quality.

"Of matings for pullet-breeding there are two, the first being that of a *Duckwing cock with Duckwing-bred Black-red hens.* Though this mating is mainly for pullets, however, occasionally a good cockerel may be thrown. The way the hens are bred is described above. The advantage to be expected from this mating is that the pullets may come a shade lighter in colour, and finer in feather and markings. In regard to the produce, as a rule the cockerels should be eaten, as they are good for neither show nor stock, except for an occasional exception as above. The Duckwing pullets may be mated with either a pure Black-red or Golden Duckwing cock—Black-red for preference—their colour being as a rule lighter and their breasts paler than the standard.

"The second mating for pullet-breeding specially, is that of a *Silver Duckwing cock, with Duckwing or pure Black-red hens.*

"The Silver Duckwing cock should be silver in colour from head to root of tail; his bars purple; a clear white diamond; wing-ends, tail, breast, shoulders and fluff all good sound black; other points as the Golden Duckwing cock.

"The Duckwing hens to mate with him should be very sound in colour—that is, one shade throughout—but a darker cast is no drawback, and the darkest-coloured hens, if sound-coloured, should be mated up in this pen; their breasts should be a deep salmon. No coarseness in colour at all should be allowed in these birds, and the darker shade is preferable.

"The same remarks hold good also for Black-red hens to be mated with the Silver Duckwing cock: the darker shades are preferable, with deep salmon breast, always provided that there is no coarseness or unsoundness in colour. These latter hens will occasionally throw a good Golden Duckwing cockerel, although the mating is chiefly for pullets.

"In regard to the produce of such mating, from the Duckwing hens the cockerels, of course, will be Silver, and may be exhibited in Variety classes. The pullets, if good, are the best of all Duckwing pullets for exhibition purposes. The markings are finer, the hackles cleaner and without cap, and there is less rust and shaft than from any other mating. They are in addition valuable for mating with a pure Black-red cock. From the pure Black-red hens, cockerels will be both Golden and Silver, but mostly Silver. If the Golden cockerels thrown should be good, they will exhibit, and will afterwards mate with pullets from pure-bred Duckwing stock. The pullets will come both Duckwing and Black-red. The Black-reds will not exhibit, but the Duckwings will, and both will afterwards breed with the Golden Duckwing cock."

Wheaten Game.

The colour known as Wheaten is little seen or used now in exhibition Game. The Red Wheaten very much resembles the colour of the skin of red wheat; the Silver Wheaten a sort of silver cinnamon, much resembling the paler sort of Sussex fowls described in earlier chapters. Formerly Wheaten hens were a great deal used to breed the brighter Black-breasted Red cockerels; Duckwing cocks were also crossed with them to breed cockerels; and they were also used in breeding Piles. But since the standard colours have been bred more systematically, these methods have been practically discarded, and the Wheaten hen is generally found too light in blood to breed well with the strains of the present day. Another objection found was that much Wheaten blood led to softness of feather; and condition of plumage has so much to do with success in modern Game, that this also led to the colour being disliked. It has now almost disappeared. On one or two occasions even lately, however, we have heard of very bright Duckwing cockerels having been bred from a Wheaten hen.

Pile Game.

The Pile Game is a striking and beautiful variety, which may be described in general terms as a Black-breasted Red with the red and coloured feathers left intact, but the black replaced by white all over the bodies of both sexes. Thus the cock's wing-bar is white, while the wing-bay is bay as usual, but with white spots at the end of each secondary feather. For the following notes upon Piles, and their breeding for exhibition, we are indebted to Mr. Walter Firth, of Read, near Blackburn:—

"This is certainly one of the most handsome of all the varieties of Game, and when properly mated, has the merit of breeding true to colour and type. The greatest difficulty is to obtain in the male bird the pure white breast, combined with a rich dark chestnut wing-bay; and in the pullets a rich salmon breast with perfectly clear wing.

"The Pile cock should be exactly similar to the Black-breasted Red, with the exception that where the Black-red cock is black, the Pile should be a pure white. In harmony with this the face, head, and throat should be a particularly bright healthy red, the beak yellow, eye as rich a ruby red as it is possible to obtain, and legs a rich orange yellow, the deeper in colour the handsomer the bird. The hackles are a clear orange yellow, free from striping; back and wing-bows a rich orange-red inclined to crimson, the saddle shading off to match the neck-hackle, or clear orange yellow; wing-bar and wing-butts a pure white, breast and thighs ditto. The bird must be tall, well up on the leg, with long fine head and neck, and square prominent shoulders, with shoulder-points well forward. The neck hackle should fit closely and evenly, and not be twisted as is very often the case. Other points should, of course, be according to the general features of exhibition Game, but any fault in these is specially conspicuous in a Pile.

"The Pile hen will match the cock in make, head, face, eye, and legs. Her body colour is creamy white, as pure from any red markings on the wings as possible, although a little warm colour, so as to give the bird a rosy appearance, if not too much so, is no great fault: still, the clearer the wing the better, provided the breast is a good rich salmon colour, and not a pale yellow, as is sometimes found. It is quite an easy matter to breed clear-winged pullets with pale breasts, but these should not find favour in the show-pen; better far allow a trifle for a little colour on the wing and have a rich-coloured breast, than give way to pale-breasted pullets because of their clear wings.

Breeding Piles.

"Piles may be bred true to colour for a year or two, by breeding from Piles of both sexes. For breeding cocks it is particularly desirable that the hens should be well rosed on the wings, and with good deep breast colour, and be as tall and as prominent in shoulder as possible. Never breed from light-eyed birds, or from any having a twisted breast-bone. The cock for cock-breeding should be a good exhibition specimen as already described, with plenty of reach, and a tail fine in feather, short, carried just above the level of the back, and the sickles short, fine, and well tapered at the ends. He should also be broad in chest, and sound in eye-colour. If size, reach, and stamina are required, never use a breeding bird under twelve months old.

"For pullet-breeding, on the other hand, it is necessary that the hens should be as free from colour on the wing as possible, while good in breast; and the cock to mate with them should be a darker shade of top-colour—more inclined to a brickish red all through. If he is a bit marbled on the breast it may be all the better, providing his wing-ends and wing-butts are a clear white, and his wing-bays sound.

"To breed true to colour it is necessary to in-breed, and continue to do so until the produce shows either signs of weakness, softness, or want of size, or until the leg-colour and top-colour become too pale. It is then advisable to introduce a cross of Black-red blood, by mating a Black-red cock to Pile hens. By doing this, rich-coloured cocks will be obtained, and also some good useful cock-breeding pullets for next season's mating. This is for cock-breeding; but the pullet-breeding pen must be kept as pure as possible, by retaining each year the most likely breeders for future use, the Black-red blood only coming in indirectly through the cockerels bred from it."

In choosing a Black-breasted Red cock for crossing with Piles, particular care should be taken that he is a sound rich chestnut in his wing-bays. The pullets that come from the cross are generally willow-legged, but very sound on the breast; and several times we have had reported to us good results from putting a few of the best of such birds with a good pullet-breeding cock whose father was also a Pile. A very fine pullet was also represented to have been bred from a quite pale-breasted pullet mated with a Black-breasted Red cockerel, but with *yellow legs*, which had been bred from Piles. Any breeder will recognise the possibilities from crosses of this kind, and the principle which underlies them.

Other Colours.

Other colours are scarcely ever now seen in exhibition Game, and may be dismissed in a few words. We have in former years seen at Birmingham large and fine classes of Black and Brassy-winged, the latter admitting the golden feathers which are such a difficulty in the males of most black fowls: there were also good classes of Whites. Up to the time we write there is still a refuge there for both colours combined, but there are few entries, and still fewer exhibitors. In the classes for "Any Other Colour," the entries were Silver Duckwings, referred to above, Blue Duns, and Mottles. The fact is that all these colours belonged to a time when the fowl was nearer the old type; and have their proper place now in the Old English Game classes.

Rearing Game.

Though the long limbs of this breed look unsightly on the table, the flesh is still good, and abundant on breast and wings. Many of the present hens are also very good layers. Hence the exhibition Game is by no means an unprofitable fowl where there is room enough to keep it to advantage, as the surplus can be eaten to profit, while the hens and pullets will pay their own way. The great length of limb, as in all other cases, has however brought with it considerable delicacy of constitution in the shape of leg weakness. A great help against this is Parrish's Chemical Food, and care should also be taken not to attempt to push the chickens on too fast, or to great size, as it were, but to let them grow up on plain food, with plenty of exercise, in a hardy manner. Whatever may be the case with other breeds, exhibition Game chickens, at least, get on distinctly better when hatched and reared under hens; the individuality and activity suit them better, especially when the hens can be allowed a large amount of liberty. For the following remarks upon rearing and exhibiting we are further indebted to Mr. Samuel Matthew:—

"The best way to rear and manage Game

chickens is to place a coop in a warm or sunny situation, with plenty of dry earth below: this being a good deodoriser, keeps the coop fresh and clean with a little attention. It is necessary for good rearing that the chickens should have a good grass run. Where this cannot be given, the best plan is to sow some oats and dig them deep into the ground. The oats will soon sprout and provide some fresh green food, which is so necessary to keep them in good health and condition. As to feeding, I find nothing better than Spratt's chicken-food, mixed fresh each day as follows: I break the contents of a fresh raw egg over some of the food, then mix it further with boiling water to such a consistency that it will crumble in pieces when given to the chickens. It must not be mixed too moist. After the chickens are about a fortnight old, for a change, a mixture of fine middlings and oatmeal may be mixed in the same way. Be very careful that *any* meal is quite sweet, not in the least musty, or rancid, or sour, and avoid foreign meal, which is often inferior. It is necessary always to let them have a good supply of coarse sharp sand, or dry road-scrapings, grit being necessary to enable them to digest their food. If the chickens seem at all ailing or sickening, bread soaked in sweet milk is a good change of diet. After a time, an occasional feed of wheat soaked for some hours in water, may be given at night, commencing in small quantities; and later on some good sound barley may be given for a change. There will, of course, be refuse or waste birds among the broods, breed them how you may; therefore, as soon as possible select the most promising, and draft out the others for table or other purposes, so that a larger run may be left for the good birds.

Dubbing Game.

"The necessary process of dubbing is best performed with the bird in the hands of an assistant, who understands the proper way of handling a Game fowl. Using a pair of surgical scissors, the operator cuts first from the back of the wattles, taking that part between the blades and cutting towards the beak, being careful not to cut too deeply, or the jaw-bone might be injured. Now that heads are desired so fine, this is best done at six months old, leaving the comb till nearer eight months old. To take off the comb, the operator stands in front of the bird, cutting from the beak to the back of the skull, and keeping the scissors firmly down to the head. If the operation is carefully done the wound will heal in a few days, but care must be taken to keep the birds from fighting, as a few minutes' fighting before healing has taken place, might probably cause disfigurement for life. It is no use dubbing cockerels before runs can be found for them, as those which have agreed before will always fight after it: the operation has so changed their appearance, that they meet as strangers, and will no longer agree.

"Long training in pens is not good for Game. The best way of training for exhibition is to place a bird in a show-pen for two or three days only at a time, with intervals of three or four days between each time, training them to take food from the hand. Then they should be accustomed to feed from the hand held high up in front of the pen, so as to induce them to stand up, come well to the front, and show off well. In general the bird should be made as tame as possible, when he will not mind being handled, and birds once thoroughly trained never seem to forget it."

It is usual to trim the heads of Game cocks a little before exhibition, removing with scissors the line of little spiky feathers at the sides of the amputated comb, close to the head, and also the little feathers which project from the face. Some draw out the latter, as is done in Spanish faces; but in this case they grow again.

Very few words will be sufficient for the controversy which now and then arises about the operation of dubbing Game. Almost without exception the assumed humanitarians have been totally ignorant of Game fowls; and it is gravely to be regretted that the names of some persons in high position should, by the mistaken representations of people of this kind, have been dragged into a crusade of which they also have not been competent to judge, since they have had no knowledge of the facts and conditions. All these good people forget that dubbing originated when shows were unknown, as a practical necessity, and merely because the fighting cock, when undubbed, was fatally handicapped in his battle, and suffered continually during his life. The old cockers simply found that a Game cock was saved a far greater amount of suffering, and often death, by being dubbed; and they dubbed him for this and no other reason: of exhibition they knew nothing at all. Some oral and written evidence that has been quoted from "veterinarians," professing to "prove" that the comb of a fowl, "owing to its profuse supply of nerves, is specially sensitive," has on the contrary proved an ignorance on their own part quite extraordinary. Examination under the microscope of sections from a cock's comb, leads to an exactly opposite conclusion; not, of course, that there are *no* nerves of sensation in the comb, but certainly to the effect that the comb is anything but a specially sensitive part of the body. The same conclusion is suggested by phenomena familiar at times to almost every poultry-keeper with small runs, who will have seen a cock standing while the hens pecked his comb into a miserable state, with apparently entire unconcern. Dubbing was not adopted to avoid injury to the comb, but to leave no hold; because a Game cock strikes with his spur close to where he holds by his beak, and thus the face might be terribly cut, or the eyes torn out, if the comb was left on. We fear there is a large class of people whose notions of cruelty or humanity depend not so much upon *real pain or suffering*—a matter always to be taken into grave consideration—as upon the presence or absence of visible wound, or of a few drops of blood. At all events, we knew of one lady who used very strong language indeed about dubbing Game, who regularly sent a male kitten to be "made into a house cat," for the merest reasons of her own personal convenience; and that sort of thing furnishes food for reflection. Though we have had some share in the active prevention of animal suffering, we never were able to get up strong feeling about *any* operation that only takes a minute or two, has no pain of anticipation, and is apparently forgotten as soon as over; and we have repeatedly seen a Game cock begin to feed as soon as tossed down upon the ground. As, however, we believe that some people have been deterred keeping Game Bantams especially, from dreading the supposed cruelty of this operation, it seems worth while to point out that even a dentist's nitrous oxide "gas" will cause anæsthesia quite long enough to dub a bird; or if that be inconvenient, that a few whiffs of chloroform in a handkerchief will equally prevent any pain whatever.

It is not much use attempting to breed exhibition Game, any more than the Old English, without plenty of room. The cockerels may be kept together until grown, on a good run, under an old cock, as in the case of the older breed; but there is "Game" in them still, however modified, and as fast as they are dubbed they must be provided for separately. Moreover, space is required to rear the chickens of what is now a rather delicate breed, in health and condition. Finally, without range the birds cannot be shown in the hard feather which is so necessary to success. A few split peas daily for two or three weeks before a show will help this to some extent.

Judging Game.

In judging Game, style and make and condition are taken into consideration to a greater extent than in any other breed except the preceding, or in the corresponding breeds of Bantams. Hence, keen as is the competition in colour and marking now, it not unfrequently happens that a bird somewhat inferior in these will pull off the honours by great superiority in style and character of plumage: for instance, a somewhat too dark cockerel, or a too rich or a slightly foxy pullet, may be so far superior in make or feather as to win over better colour. The prize birds, or those likely to be chosen at least, should always be handled, the handling counting for a great deal in Game. Handling is also the only way to detect crooked breasts, which of late have crept into this breed more than formerly, so that occasionally, when the apparently best bird in a class is left out, inquiry will elicit the fact that it was on account of a crooked breast.

The following is the Standard of Perfection for Game, adopted by the Poultry Club in consultation with the United Game Club:—

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Long, fine, and narrow across the eyes. *Beak:* Long and gracefully curved, and strong at the base. *Eyes:* Prominent. *Comb:* Single, small, upright, of fine texture, and evenly serrated at its edge. *Face:* Smooth. *Ear-lobes and Wattles:* Fine and small to match the comb as nearly as possible. (NOTE.—It is customary to exhibit Game cocks after being dubbed, having their comb, ear-lobes, and wattles removed, and leaving the head and lower jaw smooth and free from ridges.)

Neck.—Long and slightly arched, fitted with "wiry" feathers, but thin at the setting on of the body.

Body.—Short back, wide front, and tapering to the tail. *Back:* Flat, and shaped like a smoothing iron. *Wings:* Short, strong, and powerful. *Shoulders:* Prominent and carried well up.

Tail.—Short, fine, and closely whipped together, carried slightly above the level of the body, with the sickles fine and well pointed, and only slightly curved.

Legs and Feet.—*Legs:* Thighs strong and muscular, shanks long and well rounded. *Toes:* Four in number, long, fine and straight, the fourth or hind toe carried straight out and flat on the ground, not downwards against the ball of the foot, which, known as "duck-footed," is most objectionable.

Carriage.—Upstanding and active.

Weight.—7 lb. to 9 lb.

Plumage.—Short and hard.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—5 lb. to 7 lb.

COLOUR

THE BIRCHEN

Beak: Dark horn. *Eyes:* Black. *Comb, Face,* *Wattles, and Ear-lobes :* Dark purple. *Legs and Feet :* Black.

Plumage of the Cock.—*Hackle, Back, Saddle, Shoulder-coverts, and Wing-bows :* Silver-white, the neck-hackle with narrow black striping. *Remainder of Plumage :* A rich black, the breast having a narrow silver margin round each feather, giving it a regular laced appearance gradually diminishing to perfect black thighs.

Plumage of the Hen.—*Neck - hackle :* Similar to that of the cock. *Remainder of Plumage :* A rich black, the breast very delicately laced as in the cock.

THE BLACK-BREASTED RED

Beak : Dark green. *Eyes, Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs :* Willow.

Plumage of the Cock.—*Cap :* Orange red. *Neck-hackle :* Light orange, free from black stripe. *Back and Saddle :* Rich crimson. *Wings :* Bow, orange ; bar, green-black ; secondaries, rich bay on the outer edge of feathers, black on the inner edge and tips, only the rich bay showing when the wing is closed ; primaries, black. *Remainder of Plumage :* Green-black.

Plumage of the Hen.—*Neck - hackle :* Gold, slightly striped with black, running to clear gold on the cap. *Breast and Thighs :* Breast a rich salmon, running to ash on thighs. *Tail :* Black, except the top feathers, which should match the body colour. *Remainder of Plumage :* A light partridge brown ground, very finely pencilled, and a slight golden tinge pervading the whole, which should be even throughout and free from any ruddiness whatever, and with no trace of pencilling on the flight feathers.

THE BROWN-RED

Beak : Very dark horn, black preferred. *Eyes, Comb, Face, Wattles, Ear-lobes, Legs and Feet :* Black.

Plumage of the Cock.—*Hackles, Back, and Wing-bow :* Bright lemon, the neck-hackle feathers striped down the centre with green-black, not brown. *Remainder of Plumage :* Green-black, the breast feathers edged with pale lemon as low as the top of the thighs.

Plumage of the Hen.—*Neck-hackle :* Light lemon to the top of the head, the lower feathers being striped with green-black. *Remainder of Plumage :* Green-black, the breast laced as in the cock, the shoulders free from ticking and the back from lacing. (NOTE.—There should be only two colours in Brown-Red Game—viz. lemon and black. In the cock the lemon should be very rich and bright, and in the hen light ; the black in both sexes should have a bright green gloss, known as beetle-green.)

THE GOLDEN DUCKWING

Beak : Dark horn. *Eyes :* Ruby red. *Comb, Face, Wattles, and Ear-lobes :* Red. *Legs and Feet :* Willow.

Plumage of the Cock.—*Hackle :* Cream white, free from striping. *Back and Saddle :* Pale orange or rich yellow. *Wings :* Bows, pale orange or rich yellow ; bars and primaries, black with blue sheen ; secondaries, pure white on the outer edge of the feathers, black on the inner edge and tips, the pure white alone showing when the wings are closed. *Remainder of Plumage :* Black, with blue sheen.

Plumage of the Hen.—*Hackle :* Silver white, finely striped with black. *Breast and Thighs :* Salmon, diminishing to ash grey on thighs. *Tail :* Black, except top feathers, which should match the body colour. *Remainder of Plumage :* French or steel grey, very slightly pencilled with black, and even throughout.

THE SILVER DUCKWING

Beak, Eyes, Comb, Face, Wattles, Ear-lobes, Legs and Feet : As in the golden variety.

Plumage of the Cock.—*Hackle, Back, Saddle, Shoulder-coverts, and Wing-bows :* Silver white. Secondaries, pure white on the outer edge of the feathers, black on the inner edge and tips of bay, the pure white alone showing when the wing is closed. *Remainder of Plumage :* Lustrous blue-black.

Plumage of the Hen.—*Hackle :* Silver white finely striped with black. *Breast and Thighs :* Breast a pale salmon diminishing to pale ash grey on thighs. *Tail :* Black, except top feathers, which should match body colour. *Remainder of Plumage :* Light French grey, with almost invisible black pencilling.

THE PILE

Beak : Yellow. *Eyes :* Bright cherry-red. *Comb, Face, Wattles, and Ear-lobes :* Red. *Legs and Feet :* Rich orange yellow.

Plumage of the Cock.—*Hackles :* Bright orange ; dark or washy hackles are to be avoided. *Back and Saddle :* Rich maroon. *Wings :* Bow, maroon ; bar, white, free from splashes ; secondaries, dark chestnut on the outer edge, and white on the inner edge and tips, only the dark chestnut showing when the wing is closed ; primaries, white. *Remainder of Plumage :* Pure white.

Plumage of the Hen.—*Neck - hackle :* White, tinged with gold. *Breast :* Rich salmon. *Remainder of Plumage :* Pure white.

SCALE OF POINTS

Style and shape	30
Colour	20
Condition and shortness of feather	10
Eyes	10
Tail	10
Legs and Feet	10
Head	5
Neck	5
	100

Serious defects : Eyes other colour than standard ; flat shins ; crooked breast-bone ; twisted toes or duck feet ; wry tail ; crooked back.

CHAPTER XXIV.

DORKINGS AND SUSSEX FOWLS.

WITH the much greater knowledge and experience of poultry which has been accumulated during half a century since exhibitions have been held, it has become more and more certain that the English Dorking, at least, is one breed which we unmistakably owe to the Roman conquest of Britain. It has been already intimated, on Cæsar's authority, that the ancient Britons did not eat fowls at that date; but the Romans did, and had learnt to select their table fowls with some care; and the Roman writer Columella describes as the best and most esteemed, a bird with all the essential marks of the Dorking race, which there can be no reasonable doubt that the conquerors carried with them into Britain, unless they already found it there, which is scarcely likely. Some objection has been made on the score of the colours mentioned by the Roman writer, but with no real ground when it is remembered how variable such a point is; in fact, he implies that various colours were known, and it is further to be remarked that one of the most ancient varieties—the Red Dorking—closely resembles that to which he gives most prominence, "red or tawny, with black wings." He describes hens with robust bodies, "square-framed, large and broad-breasted," with large heads, and small upright combs, adding that the "purest" breed are five-clawed, which should be so placed that "no cross spurs" arise—a well-known fault in early exhibition days. The cock is to have the same number of claws, breast broad and muscular, "tail lofty," legs sturdy and not long, but "armed as it were with dangerous spears," another allusion to the extra spurs once so prevalent. All the real essentials of the Dorking are to be found in these details; and it is interesting to see that the fifth toe, in particular, which has been said to be cultivated as a mere exhibition point by the "fanciers," has on the contrary come down to us from the Romans, as the mark of their "best" race of table fowls.

It is remarkable how closely the Dorking we know to-day has preserved all the main points stated by the old Roman writer. It is still a fowl, or should be, with large broad breast, square frame, short legs, and five claws. With us it has become now divided into several distinct varieties, known as the Dark or Coloured, the Red, the Silver-grey, the White, and the Cuckoo Dorking. Some of these present points of interest in their history.

Origin of Dark Dorkings.

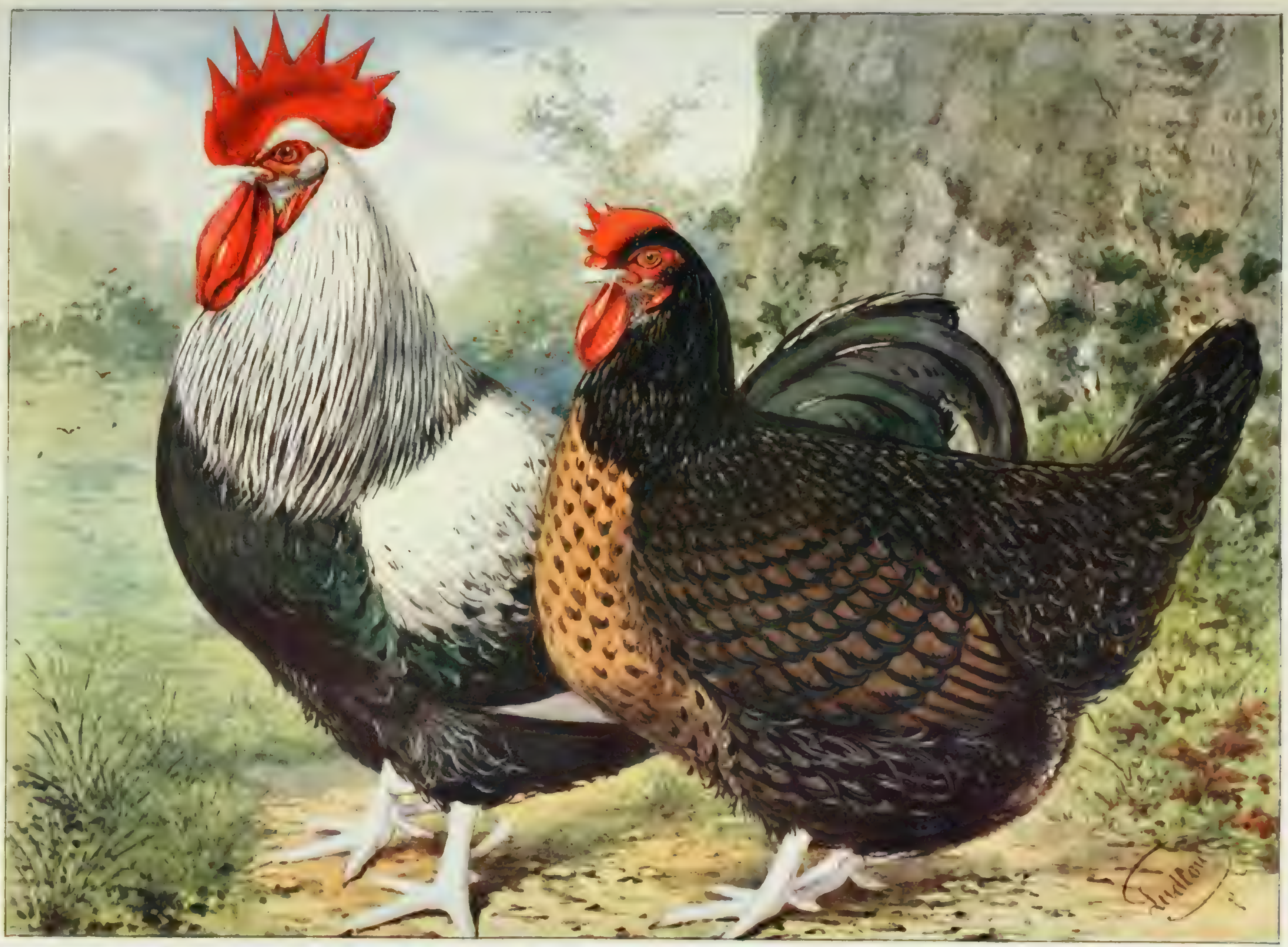
The origin of what may be termed the "essence" of the Dorking race has been given above; but in regard to what has been called successively the Grey, or Coloured, and more lately named the Dark Dorking, there has certainly been a great deal of other blood, and considerable transformation, in more recent times. It is practically beyond controversy that this fine race was formed by crossing some real Dorking stock upon the large four-toed Surrey fowl. In the earlier years of the nineteenth century the pure (five-toed) Dorking strain appears to have been confined to, and centred in, the rose-combed White Dorking, and perhaps also the single-combed Red Dorking presently described, but which was little known in comparison with the other. In his first edition of 1815, Bonnington Moubray describes the breed as "genuine colour intire white; chief distinctive mark, five claws upon each foot," and spells the name "Darking." He adds, however, how even at that date claims were made that the true fowls were raised in the Weald of Sussex, Horsham being the chief market for them; and how those who made this claim maintained that the five claws were "merely fortuitous, and in fact objectionable, and that those so marked are deemed a bastard breed." No evidence can be clearer than that these were mainly the large four-toed Sussex or Surrey fowl, more or less crossed with the five-toed Dorking. In the earlier books upon poultry, and especially in *The Poultry Book* of Messrs. Wingfield and Johnson, published in 1853, it is stated that the Coloured Dorking came with four toes and five toes, and even with six toes; and the cock figured in the coloured plate, which had won many prizes, had three back toes on one foot. The late Capt. Hornby records in the same work, how from the same stock he bred different colours, and about half double or rose combs, though the parents were single-combed birds; while the late Mr. John Baily also writes that in Coloured Dorkings "almost every colour may be produced from the same parents." It is also stated in the same work that as many birds occurred without the fifth claw, as with that distinctive member. All the evidence, of many breeders, unites to show that the Coloured Dorking was produced by crossing a really five-toed Dorking race, probably the rose-combed White, but possibly in some cases the single-combed Red, upon the large dark Surrey or Sussex fowls. These earlier birds were as a rule of a grey speckled colour, from which the name Grey Dorking was derived.

Change in Dark Dorkings.

But other crosses have since taken place. In the tenth and enlarged edition of Moubray published in 1854, Mr. Meall states that to his personal knowledge many of the black-breasted Dorkings were produced by crossing with Spanish fowls, both in Sussex and around Wokingham, and which cross had imparted the very large upright comb, and a tendency to white ear-lobes, besides a somewhat hollow or high-carried breast. There can be little doubt that the immense combs now seen on many cocks are due to this cross. Finally, in 1857 the size of the breed was increased by at least two pounds per bird, the colour modified, and the constitution improved, by a cross made by the late Mr. John Douglas, with a bird which had come from India, and which has therefore been stated to have been of "Malay" type, but quite erroneously. The bird in question was neither long-legged, nor yellow-legged, nor low-tailed: in fact, from the description following, while he may have had some grey Chittagong character about him, it certainly contained far more of Dorking type than usual, and some of these Chittagong birds which we have seen evidently possessed a great deal. The following is the account written for us by Mr. Douglas himself, in 1872, of this now historic cross, to which so much of the present Dorking character is due:—

> Dorkings in 1857 were considered of a good show weight if the cocks attained nine pounds and a half and the hens seven pounds and a half. The hens were then either of a grey or brown ruddy colour, and the cocks always showed a great deal of white in the tail, with breasts inclined to be speckled of various colours; not any standard colour, as shown at the present day.
>
> The first and only time I made a cross was with a dark grey cock, which had come from India, weighing thirteen pounds. This bird was a model single-combed Dorking in all but the fifth toe, which was absent; and it is quite wrong to say he was of the Malayan type, for there was not the least type of Malay about him: he had white legs, and all the characters of a Dorking, except, as before stated, the fifth toe. I firmly believe he must have been a cross from a bird of the Dorking tribe taken out before to India, with what cross I could not say, but certainly not the Malay. I put to this bird seven hens eighteen months old, and the produce turned out far beyond my expectations—all were decidedly of the Dorking type, and very few but what had the Dorking toe. Some of the pullets when seven months old weighed nine pounds, and the cockerels ten pounds and a half; while at eighteen months several hens reached ten pounds and upwards, cocks coming up to thirteen pounds; and one bird in particular, when two years and six months old, weighed as much as fourteen pounds and a half, which was the heaviest weight I ever obtained in the Dorking fowl.
>
> So much for the first cross. The following season I mated one of the cockerels thus produced to thirteen of the old hens, and the imported cock to seven of his own cross-bred pullets. From the cockerel with the hens I chiefly obtained my uniformity of colour in the pullets, and also my very dark cockerels; but I also found I had obtained a much stronger constitution. From this year's breeding many yards obtained the new blood, both by eggs and birds bought of me; and from that date (1858) we began to find at our shows a steadily increasing number of the Dark Greys, and heavier weights began to be shown.
>
> After the second year I lost the imported cock, and then had to work with the two yards I had formed, but which I found no difficulty in doing. The stronger constitution thus introduced continues to the present time, breeding also up to this very day far more uniformity in colour. Whole yards of Dorkings may now be found which run as true to colour as Brahmas or Cochins; whereas before this time almost every hen was different in colour, so much so that out of a hundred hens in a yard it was a difficult matter to get three out of the lot to match. We have also thus obtained longer bodies, greater width in shoulders, more length of breast, and greater depth in the keel or breastbone, where a proportionately greater amount of flesh can of course be put upon the birds; in fact the fowl is now heavier-fleshed all over, with no more addition of offal in proportion.

There is yet a little to add before we can consider complete even this briefest outline of Dark Dorking history. The breed as Mr. Douglas left it was darker than before, the "speckle" being gone, and the cocks mostly black-breasted. But fanciers and judges made it by their selection darker still, until the feathers over the hen's wings and back became practically black, with only the shaft of the feather showing white, more and more black coming into the cock's hackles. With this extremely dark colour came in, unfortunately, more or less of sooty feet and legs. This blemish led at one time to much railing against the cross which Mr. Douglas had made, as being the cause of the sooty feet; but for this charge there was no real foundation. The bird he had used was quite white in the feet; and for years no dark feet had appeared in consequence. As



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DARK DORKINGS

we pointed out at the time, it was breeding the birds *nearly black* that did the mischief, such body colour always tending to sooty feet in every race of poultry. The dark colour had been liked, as looking larger in the pen, and had been fashionable, and had brought dark feet with it, as such colour always will. But the fault caused some reaction; and when such very dark birds no longer ruled, the dark feet soon disappeared.

The Modern Dorking.

The Dark or, as it was formerly called, the Coloured Dorking until quite recent years well maintained its position as an exhibition fowl, and still, with the other colours, yields to none in its splendid utility qualities. For the time it has been elbowed aside by newer varieties, some of which owe not a little to the Dorking themselves; but, in common with all who remember the splendid classes of Dorkings in the past at our classic shows, we trust that they may yet enjoy their own again.

The following notes on Dark Dorkings are contributed by Mr. M. F. Smyth, The Lodge, Coleraine, Ireland, who has probably bred them longer than any other exhibitor of the present day:—"Dorkings are not a breed of fowls suited for dwellers in towns, or for small runs, it is true; but that they can only be kept satisfactorily on very dry soils is quite a fallacy. The soil here is a heavy clay, and lies low, and our climate in the north of Ireland is one of the wettest in the three kingdoms; yet I have bred Dorkings on it for over thirty years with very considerable success.

"One of the great advantages of the Dark Dorking is that it needs so little preparation for exhibition: merely to have it well accustomed to being penned, to wash its legs and feet thoroughly with soap and water, giving the comb and wattles a rub over with a damp sponge before sending it off to a show. The Dark Dorking has also 'the pull' over its lighter coloured brethren (Silvers or Whites) in not requiring much shading from the sun, nor can its legs lose their colour on any soil, as is, I believe, often the case with some of the now fashionable yellow-legged breeds. What, however, tends more than anything else to make it so largely kept, is that a very wide range of colour of plumage is now allowed, and birds have not to be bred to a particular shade or marking of feathers, as in so many other breeds.

"That the Dark Dorking of to-day has changed its colour considerably from forty or fifty years ago is undoubted; and that no alien blood has ever been introduced, save the one dark Indian-bred cock mentioned by the late Mr. John Douglas, I do not for a moment believe. The Dark Brahma, once all the rage, was probably an outcross formerly at times employed, as evinced in the feathered legs and buff-tinted eggs, which I am glad to say are now much less seen than formerly. Of late years I cannot help thinking that the Indian Game, and possibly the Langshan, may be accountable for the coarser appearance, and still more for the erect carriage, sloping back, and the general want of roundness of breast, as well as for what I should myself describe as a want of quality. When first I began exhibiting Dark Dorkings it was only the very dark-feathered birds that mostly caught the judge's eye; but now a much lighter colour of plumage, especially in the cocks, is not only recognised, but by some preferred, this change to a lighter shade being accompanied by whiter feet.

"The Dorking being essentially a table fowl, size is naturally of much importance. The old-fashioned Dorking was a short-legged, compact, and active bird, and many of the old breeders, like myself, think that in the desire to get size, a coarser and less typical bird has been produced, which just now finds favour with many judges. In Dark, as in all the other colours of Dorkings, the shape and colour of the feet are most important, and the legs, feet and toe-nails should be quite white. The feet of a Dorking should be large, well spread, and the toes perfectly straight, a crooked middle toe being a by no means uncommon failing. The fourth and fifth toes should stand out separately from the leg, the former pointing slightly downwards, with the fifth toe turning up towards the leg. I like to see the fifth toe thin and hard, as coarse drooping fifth toes are not only most unsightly, but are apt to strike against each other when the bird is walking. The fifth toe of the Dorking is in my opinion an abnormal point, and is in consequence often malformed. In some instances there is a more or less distinct sixth toe, while in others the fifth toe is entirely wanting, either of which should certainly disqualify a bird, no matter how good it may be in other points. Another peculiarity also, I believe, arising from the extra or fifth toe, is a double toe-nail. These double nails are confined entirely to the upper toes, sometimes on one foot only. Often the double nail is a mere split or division in the nail, but in any form I greatly dislike it, as being not only most hereditary, but likely to lead to all sorts of monstrosities in the fifth toe, and I would never myself breed from a Dorking with either a double nail or a gouty foot or toe.

"The Dorking should be a long, low bird, standing on short legs, and clean, hard feet, with a full, round breast. The cock should have a comb of medium size firmly set on the head, and a fine, flowing tail; the hen with her comb well turned over to one side. In both sexes I like to see the comb of a nice, fine texture; a cock with a big, coarse comb lopping over being always to me an eyesore.

"In breeding Dark Dorkings I like a big cock, broad and flat in the back and full in breast, with large masculine head and firmly set comb, free from side sprigs. He should stand well on his legs, and should be possessed of a fair amount of bone, too fine a leg-bone being often accompanied by a general want of substance. My own fancy in a stock cock is what the Scotch call 'a big, rough bird,' and if possible one that has been but little exhibited. I would much prefer to breed from a big, raw cockerel, coming from a yard where winners were bred, not bought, rather than from a crack show bird. Strange as it may seem, I have rarely ever myself found the most perfect show cocks make the best stock-birds, while several high-priced and noted winners that I have bought, for a change of blood, have proved quite useless for breeding, probably either from over-forcing or over-exhibiting. Many prefer breeding from an adult cock, especially with pullets; but I rarely ever use any but cockerels, as I find them much more reliable in producing stock early in the season. In any breed in which size is of importance, in-breeding must not be carried too far; but at the same time I do not consider a constant introduction of fresh blood at all so necessary as many do.

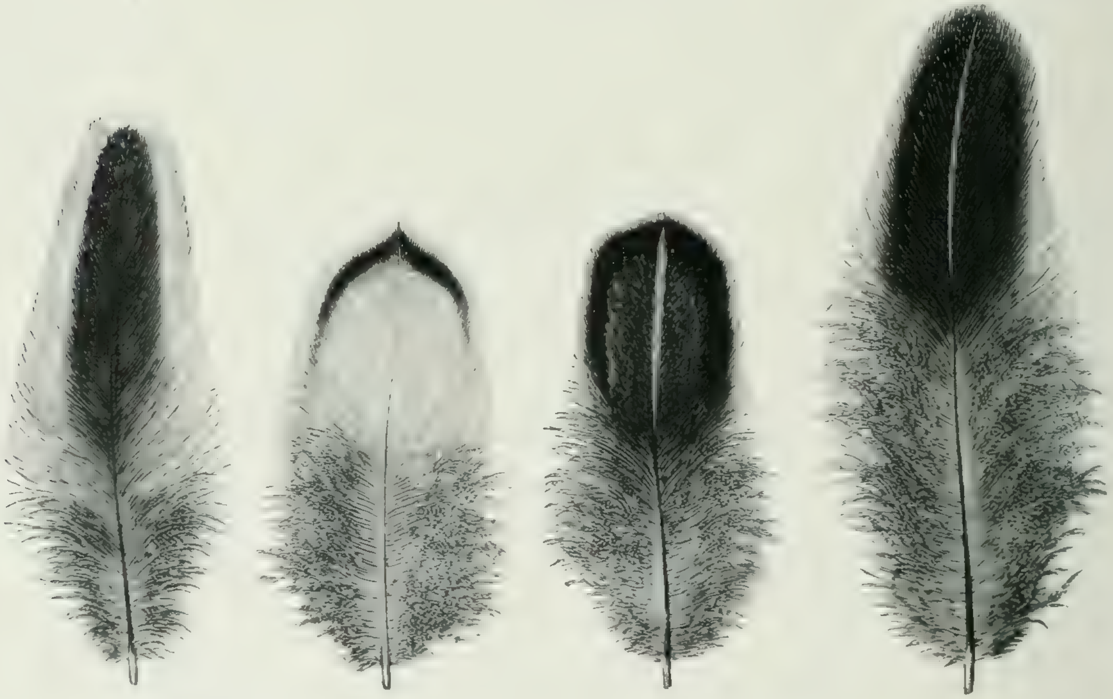


Fig. 117.—Feathers of Dark Dorking Hen.

A great point is to find out what particular strain blends well with one's own, and when getting fresh blood I always try to obtain birds with a good amount of my own strain in them.

"In breeding Dark Dorkings I never match up separate pens to produce cockerels and pullets, nor do I consider it necessary. My fancy in cocks is the lighter shade of plumage, that is, a whitish neck and saddle, ticked or striped with black or grey, but I object to the very white hackles that remind one of a badly coloured Silver-grey. My reason for preferring the light-feathered cocks is that they are much more likely to produce white-footed chickens;

I also consider them generally more typical Dorkings in shape. No one is probably less particular than I am as regards colour of plumage in Dark Dorkings, but I like to see the breast and thighs in the cocks black, with little or no white mottling appearing, and with a full flowing black tail. The ear-lobes in the cocks should certainly be red or nearly so, though some of the older fanciers say that in old times the ears were mostly white.

"My birds are mated up about the beginning of December, and are not afterwards exhibited that season. To win at the early shows, you must have your chickens hatched in January or early in February, but for the big autumn shows the March chickens are generally the best. I never set a Dorking hen on eggs if I can possibly avoid it, for though they sit well, they are so heavy and clumsy that they often crush the chickens when hatching.

"My chickens never get custard or chopped eggs. At first I give oatmeal and Spratt made into dough, with a little milk to drink. In the way of grain I use canary seed at first, and afterwards groats. Meat or flesh of some kind I often see recommended for moulting fowls; and in cold weather, given in moderation, I dare say it is at times useful, but used too freely it is often the cause of those big, flabby, soft-looking combs, which are constantly falling over or breaking out into canker in the cocks, as well as of that vile habit one hears so often of, the hens pecking the cocks' combs."

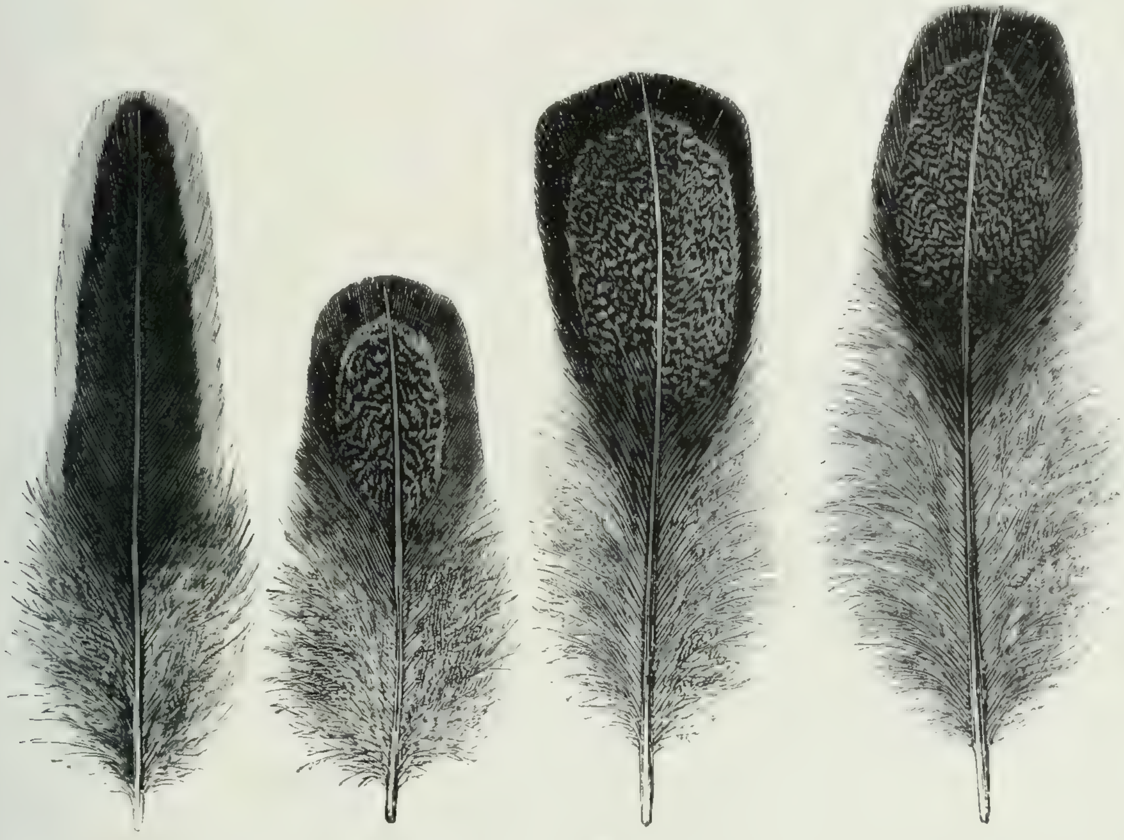


Fig. 118.—Feathers of Medium Dark Dorking Hen.

The following remarks on the colour of Dark Dorking hens or pullets are kindly added by Mr. T. Coke Burnell, who was well known both as an exhibitor and judge until health compelled a sojourn for some years upon the Continent, but who subsequently returned to England, and was enabled to compare present exhibits with what he was familiar with:—

"As to colour in Dorking hens, provided the wings are not rusty, and the breast feathers have not a very faded or washed-out appearance, I should not be over ready to condemn an otherwise good bird. The general tone of colour of the hen must be dark; a light-coloured hen would not match a dark cock. The majority of prize hens now exhibited have a striped neck hackle; but a black neck hackle and tail, the back and wings being of a dark grey colour, and each feather edged or spangled with black, is very taking. The breast colour may be of any tinge from salmon to dark chocolate. It may thus be inferred that any particular shade of colour—of course, excepting a solid black—is not to be criticised too severely; the great points being the true Dorking shape, short legs, white feet, five toes distinctly formed and matching, comb falling over or folding—I prefer the latter—with the long and deep breast bone, and the horizontal carriage of body that should be found in all good Dorkings, and size. I have never used other hens than Dorkings for sitting, but they should be gently and firmly handled, and have plenty of room."

The colours most often seen in Dark Dorking hens are represented by Figs. 117 and 118. Fig. 117 shows the nearly black plumage on the back, with the wing-feathers bordered with black round a greyish centre covered with marking, as described in the Standard. At one time birds were shown darker on the wings and cushion than even this; but that extreme has been discarded as noted above. Fig. 118 shows the grey marking carried more over the body, though still margined with black, as described above by Mr. Burnell, which is not only quite a permissible colour, but certainly ought to be recognised as such, though not mentioned in the Standard. Some of the finest hens shown have been of this colour, which is a better one for whiteness of feet than the "nearly black" plumage.

The following notes on breeding and rearing Dark Dorkings were contributed by Mr. Rufus Goodfellow, for long poultry manager to Mr. Herbert Reeves, of Emsworth, Hants, a prominent and successful exhibitor until the latter's retirement from the fancy in 1910:—

"I have now bred and exhibited Dark Dorkings for a good many years, and from my experience they are one of the most valuable breeds we have, being hardy and easy to rear if well attended to. They are also very good layers, especially in the winter months. For some years past I have had a good supply of eggs during autumn and in the winter, when eggs are most valuable for breeding the early chickens for the summer shows. I generally allow my hens to sit as long as they like in the summer for rest; then they have an early moult, which enables them to get strong before breeding. If careful attention is given to the birds in the summer months, looking out those that you intend to breed from, and giving them a good run—nothing suits the Dorking better than the unlimited run of a farmyard—then when you mate up in the autumn with a strong cockerel, eggs will be plentiful and mostly fertile, and hatch strong, vigorous chickens that will grow rapidly.

"I always find the best results, as a rule, from two-year-old hens mated with a one-year-old cock, or with a cock of the same age; but I have also had some good results from pullets mated with a cockerel. In the year 1897, for instance, I bred my famous team of Silver-grey Dorkings, which swept the deck at the Palace that year, from a cockerel and pullets, thus proving that Dorkings are not so delicate as most people think. My Dorkings are kept on enclosed or limited grass runs, but I always keep them in good health, and hatch strong chickens. I find that, as a rule, the January chickens thrive much better than those hatched in March or April, and have had cockerels put on half a pound a week for six or seven weeks running, and still keep well on their legs. I usually feed my growing chickens in the main upon ground oats and the best wheat, with a little cut fresh bone once a day, and with this feeding I scarcely ever have a chicken suffer from leg-weakness. That complaint used to be one of the greatest difficulties in rearing Dorkings; but if the strongest and most active birds are bred from, and careful attention given in feeding, I find they scarcely ever suffer from this malady, though my Dark Dorkings are as large and heavy as those of most breeders. I have cocks weighing twelve pounds and hens eleven pounds.

"The Dark Dorking is not so useful as an exhibition fowl merely, as some other breeds. Although hens will stand a lot of showing, the cocks and cockerels will not: if shown week after week it soon begins to tell on them. Not only the excitement of the show, but the small pens now provided goes against them. Cocks are usually no use for showing after three years old, although I once bred successfully from a four-year-old bird. Hens will be useful till six or seven years old, and still win at the summer shows. I had two old hens, one of which was the challenge-cup pullet at the Palace in 1894, which did some winning in 1900, when it was still in good health, which illustrates how well they wear."

There can be no doubt that Dorkings of all varieties are considerably hardier than formerly. Part of the improvement may be traced to the Asiatic cross introduced by Mr. Douglas, and perhaps by others since, as hinted at by Mr. Smyth; but much more is doubtless due to wider acclimatisation over the country. When a breed formerly almost confined to the dry and chalky soil of the southern counties, was first transplanted to colder and damper situations, it was necessarily found delicate under such conditions; but gradually this has worn off, until the Dorking has been found to thrive even on the cold clays of Scotland. Much also depends upon the amount of air and run; and for many years the Dorkings of the late Viscountess Holmesdale, reared on the "natural" system, and at perfect liberty in Linton Park, by Mr. John Martin, were almost invincible at exhibitions, their great weight and glossy plumage carrying all before them. What Dorking chickens will not stand is either bad air or over-crowding; the latter keeps them from thriving more than almost any other breed. They are also, if hatched under hens, unusually liable to suffer from insect vermin. This is not from any special weakness, but because they feather early and quickly, and the profuse plumage gives the enemy shelter, where the scantier and later clothing of Cochins or Brahmas would afford little or none. All quick-feathering breeds which are also full of feather—and the Dorking is both—are peculiarly subject to this plague in chickenhood, and we have known many broods die off when this matter has been overlooked and neglected. Chickens hatched in incubators should not give any trouble in this way; but so many Dorkings are hatched under hens that the special caution is by no means unnecessary.

Red Dorkings.

One of the very oldest varieties of coloured Dorkings, but almost unknown out of the south-eastern district of England, is the Red Dorking. This is a perfectly pure race, never amalgamated with the Dark as the old greys and speckles have become, and in our own opinion entirely free from any cross with the White. They are not so large as the Darks, are very small boned for the size of the body, and the single upright comb is much smaller, thinner, and finer looking than those usual in the Dark or Silver-grey breeds. As table fowls there can be none better; and we cannot but think that if the few who possess them would systematically exhibit them in such Dorking classes as are offered for "Any Other Colour," they would gain more support. The cock is a black-breasted red; the hen more of a brown-red, some of them laced. Taking the colour into account, in connection with the smaller comb, it can hardly fail to be noticed that this variety comes the nearest of any to the old description of the "best" Roman birds, by Columella, already referred to. There is perhaps just a chance that some of the colour may be due to a far-back cross with the black-breasted Red Game once so diffused over England; but if such ever did happen, it must have been long ago indeed. The following notes are by Mr. Harry Hamlin, of Windsor, Berks, in whose family the strain has been kept up through two generations:—

"This little known variety of Dorking is one of the most beautiful as well as the most useful fowls we have. From what I can gather, they appear to have been common throughout the south-eastern counties before the exhibition period began, but for some cause I could never understand, to have been discarded by the early fanciers. These very likely found the Grey Dorkings easier to produce of a uniform colour, as the older Reds were apt to produce white feathers. Fortunately, our family have always preserved the Red Dorkings, and with careful selection and great care in breeding the plumage has much improved. In these fowls it is particularly beautiful and close, being free from any Asiatic taint, which, in my opinion, destroys the high quality of the Dorking as a table fowl. Many of the present Dark Dorkings have to be crossed with the Game in order to produce a good table fowl, but a Red Dorking is a perfect table fowl in itself, and requires no crossing.

"The distinguishing points of the cock are his beautiful deep red hackles, his well-formed single comb, which is somewhat smaller than the present-day Dorking, and which with his face, earlobes, and wattles are of a beautiful red; his breast and tail are black; his legs are beautifully white, and very short indeed, and he has five well-developed toes on each foot. As regards the shortness of the legs, I have just measured a very good specimen cockerel, and I find that it is three and a half inches from above the fifth toe to the point of the hock. The bird weighs ten pounds, and I think that for the weight this is very short indeed. The hens have close-fitting plumage of a brown-red colour, with low and shapely bodies.

"Red Dorkings are very good layers of a nearly white egg, good sitters, and excellent mothers. For those who require beauty, utility, and an excellent table fowl, there is nothing to equal the Red Dorkings."

Personally, from a careful examination of the very few birds we have seen, we should be disposed to say that there was a faint trace of yellow in the shanks, or perhaps more truly, of red. We do not imply in the least what is meant by a yellow-legged fowl, but a slight and undefinable shade which many years' critical observation have led us to associate with the kind of black-red colour shown in the bird's plumage, and which is generally, as in certain strains of Game, associated with delicate and tender flesh.

Silver-grey Dorkings.

Another beautiful and well-marked variety of Dorking is that known as Silver-grey, which has separate classes at nearly all important shows. In great measure these birds were an offshoot of the preceding, at a time when the Coloured Dorking was often really a *Grey* breed, from which a lighter grey could be selected. But in addition to this process of selection, it is recorded in several quarters that the Silver-greys thus selected from the Dorkings were also crossed with Silver Duckwing Game of Lord Hill's breed, in order to fix the beautiful colour of the hens; and the effects of this cross were to be seen in a slimmer build and different carriage of the shoulders. Another result of the Duckwing cross was a somewhat too silvery colour, leading to a great tendency to splashes of white on the cock's breast and thighs. Both these defects have long since been overcome, and Silver-greys are often now amongst the most typical of Dorkings, and very nearly if not quite equal in weight to the Dark variety.

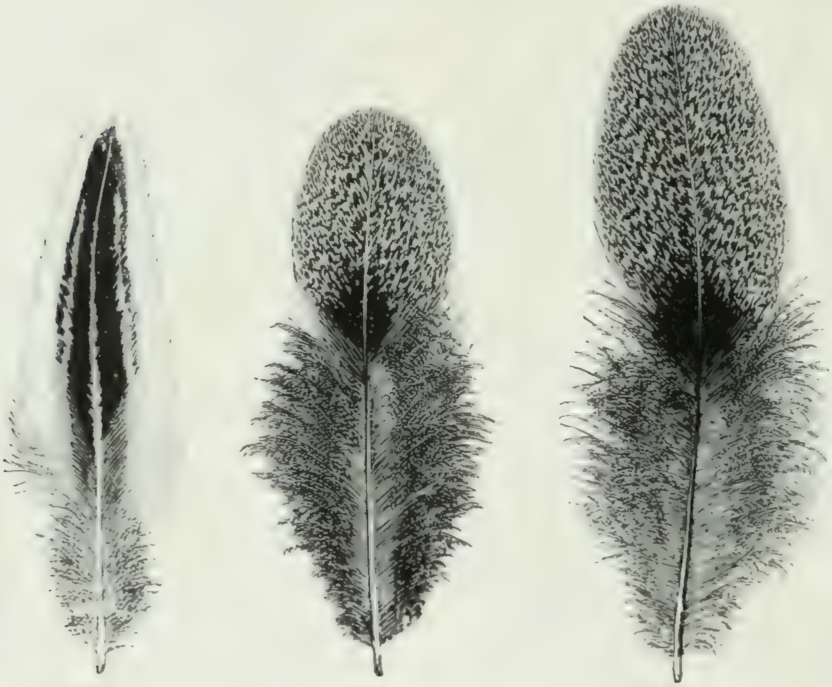

Hackle. Wing. Cushion.

Fig. 119.—Feathers of Silver-grey Dorking Hen.

The head of the Silver-grey cock should be silvery white, the neck-hackle of the same colour, perfectly free from any tinge of straw-colour, but may be (and generally is) streaked with grey in the lower feathers falling on the shoulders. The back and saddle silvery white, shoulders and wing-bow also clear white; wing-bar green-black; wing-bay white with a black upper edge; breast and under-parts and thighs jet-black, without any mottling or grizzling, except that a little on the thighs is tolerated in old birds; tail glossy black, with sound broad sickles. The white parts should have no tinge of straw, and there should be no signs of brown or chestnut bordering the wing-bar or other margins of the black plumage.

The hen's hackle is also silvery white on the head, but lower it becomes striped with black, often with a little longitudinal pencilling. The breast is a rich robin-red or salmon-red, shading off ashy colour on the thighs. The body and wings are a silvery grey ground colour, minutely pencilled over with dark grey, free from black splashes or reddish tinge, and each feather showing the white shaft, but not obtrusively: tail rather darker. The general effect varies in different birds from a bright silver-grey to a softer duller grey, but in any case should be grey. The silvery greys have usually lighter salmon breasts, and are specially apt to breed cockerels with white spots or grizzling on the breast. The feathers of a Silver-grey hen are shown in Fig. 119.

Very few have bred one variety continuously for so many years or with so much success as Silver Grey Dorkings were bred by the late Mr. Oswald E. Cresswell, J.P., of Morney Cross, Hereford, who kindly contributed the following notes:—

"It is considerably over a quarter of a century since I wrote some notes on Silver Grey Dorkings for the first edition of the *Illustrated*

Book of Poultry. I had already then had some experience in the variety, for I began while an Eton boy in the sixties to breed Silver Greys, not quite so distinctive in marking as they soon afterwards became, but still with real difference from the Coloured, or, as it was originally called, the Grey Dorking. After all these years I still possess a large, and, I hope, good stock of Silver Greys; and there has been no intervening year in which I have not reared a considerable number, and exhibited some—generally successful—representatives of my yards at some of our greatest shows. This fact, I think, speaks well for the breed, for no one would be so constant to a race which was not useful, or the culture of which was attended with any great difficulty. At large Poultry Conferences held at Reading in 1899 and 1907 I read by request papers on the relation of exhibition poultry to the practical breeding of poultry as an industry. I then stated, and repeat it now, that after an experience of over thirty years in pure-bred Dorkings, which I continuously exhibited, though never to excess, I now possess families of the race more beautiful, hardy, and productive than those with which I started.

"The origin of the Silver Grey variety I believe to have been this, as I wrote in the account of my earlier experiences. Both it and the coloured or dark variety are descended from the old 'Grey' Dorking, many specimens of which I can remember in my childhood as being what we should now call bad Silver Grey. Some fanciers bred for the lighter, some for the darker shades. Exactly when the two varieties were first classified as distinctive at shows, I cannot trace, but I remember buying a celebrated winner, a cock, at the Birmingham show of (I think) 1885, which was described by its owner as a 'Silvery' bird, though it competed with cocks having much darker hackles. Silver Greys for a while went by the name of 'Lord Hill's breed.' Probably they had been carefully bred, and possibly the type had been produced at Hawkstone, in the days of the second Lord Hill, a great exhibitor of live stock. Strange to say I could find no trace of them remaining there late in the seventies, though a mixed lot of Dorkings were still to be seen at the Home Farm.

"I think it was in 1868 that I first had a breeding pen of lighter, almost typical, Silver Grey Dorkings. They did not then breed nearly so true to markings as they have done for the last twenty-five years, and for various reasons I have always thought that the blood of Silver Duckwing Game had recently been used. Among other reasons for this conclusion were, because then and for some years afterwards it was difficult to get Silver Greys of the massive form and on the short legs which had always been characteristic of the Dorkings; because some hens laid eggs of a pinkish hue, like those of game hens; and especially because it was for a long while difficult to get them with the really white feet which were almost invariably found on pure-bred Dorkings. I remember well a strain most perfect in the desired shade of feathering, which was invariably faulty in the colour of feet. But exactly how and when the Silver Grey type was produced is not now a very profitable inquiry.

Qualities of Silver Greys.

"In Silver Greys which approach the desired standard we have confessedly a lovely breed: the hens are capital layers if only some amount of liberty be given them, which Dorking hens were not formerly; they are a fairly robust race, if care be taken to select not only the handsomest but the strongest birds for breeding, such as from chickenhood have never ailed; and as to size, though of course some Dark Dorkings can be found which distance them, I should never myself wish to see any finer or larger fowl upon the table than a well-grown Silver Grey—cockerel or pullet. Abnormal size is usually accompanied by coarseness of flesh and bone; and the latter fault is quite as objectionable as the former. Experience in poultry shows that big bones are weak bones. Chickens which suffer from leg weakness will almost invariably be found to be large in bone. How perfectly unfit a chicken with this ailment is, alike for the table and for stock, every experienced poultry-keeper knows. I have often marvelled at the ignorance of purchasers of Dorkings for stock, who must have birds 'with plenty of bone.'

"That Silver Greys are in no true sense a delicate race I have proof enough. For twenty-one years I have reared many, with little difficulty, on sticky soil (or more correctly I should say on two sticky soils), usually considered fatal to Dorkings. Troops of my chickens often sleep in trees till Christmas, and some occasionally do so with impunity through the whole winter. Certainly I have considerable acreage, and so change of ground; but though my place is on two soils, both of them are tenacious: that of the hilly woodlands being somewhat slimy lime-stone, and that of the lower, rich meadow lands in the valley of the Wye, rich alluvial loam. Common sense teaches that chickens must be treated differently on light and on heavy soils. When long years ago I had Dorkings on light ground and sand, all my coops were floorless; now, through the earlier and damper months, I coop all my Dorking chickens, and indeed those of other breeds as well, in coops with drawers at the bottom, covered daily with fresh dry earth or sand. Some of them have two drawers, usable alternately. These, of course, are not necessary when the coops are placed under the cover of dry sheds, which in frost and snow I find a good plan. I dislike small coops for Dorkings, and prefer what vendors of poultry appliances call Bantam houses. These when well ventilated serve as comfortable and wholesome abodes for a brood long after the mother has left them.

Breeding Silver Greys.

"As I wrote in the first edition of *The Illustrated Book of Poultry*, the mating of Silver Greys for breeding requires great care, and knowledge of the pedigree of both cocks and hens. In all sub-varieties purity of blood is only a question of degree, and hence there is always danger of 'breeding back' to some points distinguishing the common ancestor of more than one stock. Never buy chance Silver Greys for breeding, but select from a stock which has long been bred with care. A cock to all appearance correct in every point will often produce pullets with red wings, or even sandy-coloured all over; while, on the other hand, good-looking hens will breed cockerels with speckled breasts and tails. For the most part, it is true, both parents in these cases will produce birds of their own sex like themselves; but the penning of separate families for the production of cockerels and pullets, now unfortunately so general in the case of some varieties, is a clumsy and disappointing method by no means to be encouraged. I would select a cock as silvery as possible, with pure black breast, and mate him with hens of *medium* colour; not too pale, or many of the cockerels will have grizzled breasts. But in any case scan very critically the birds of the opposite sex in the yards from which your breeders come; and if size has to be dispensed with on one side, let it be on that of the male bird. The experience of the intervening quarter of a century and more does not lead me materially to modify these views, and these precautions in the selection of stock-birds should secure a meritorious progeny."

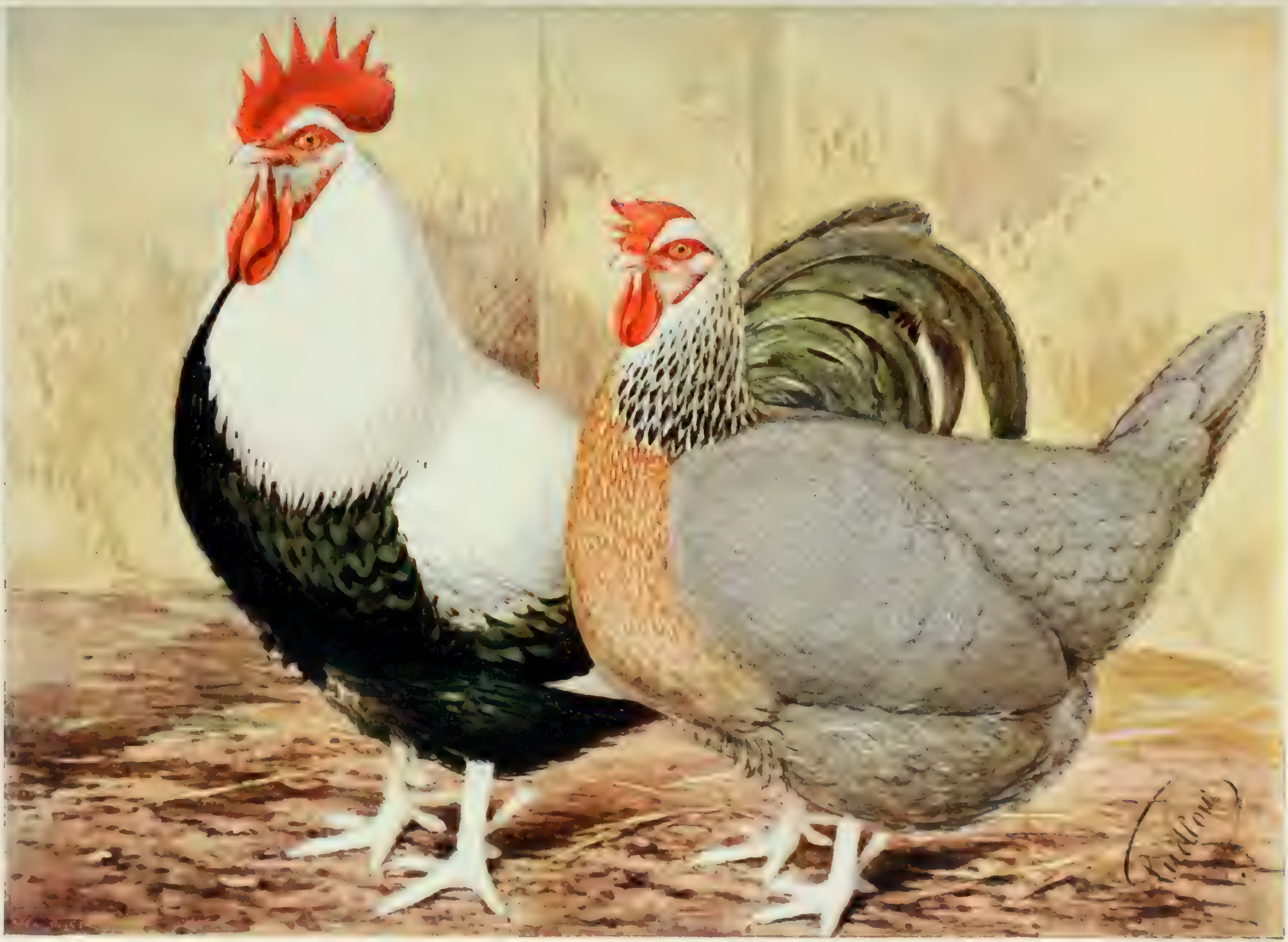
It is not necessary at the present day to mate up two pens for breeding Silver Grey Dorkings. When the very pale and silvery hens were in fashion, black-breasted cockerels were rarely produced from them, and had to be bred from darker females; and at that date it was therefore quite usual to breed cockerels from dark hens, while the pale Silver Grey pullets were bred from silver females and males more or less grizzled or speckled-breasted. But since robin-red or rich salmon breasts have been preferred, with the softer, darker grey in the rest of the plumage, both pullets and cockerels will come true to type from the same mating, provided attention be given to the pedigree or line of breeding. This is of course always important; in the case of Silver Grey Dorkings too raw a cross, even with birds that appear quite unexceptionable in points, not unfrequently results in pullets quite reddish on the wings. Another year's breeding back to either of the two strains, however, will probably remedy this, and sometimes even red-winged pullets will come out quite clear at the second moult.

Some people consider the Silver Grey Dorking superior to the Dark in quality of flesh. There is no doubt that it is now far hardier than thirty years ago, as well as more beautiful, and at the Poultry Conferences of 1899 and 1907 Mr. Cresswell connected the improvement in the two points together. In good specimens, he said, the cock's hackles are no longer affected by the sun's rays, or tanned, as they used to be. This was brought about by steady selection for pure silvery colour, free from yellow; but this latter tinge he had found, both in this breed and the White, to be a sign of liver weakness. Hence breeding for colour was, in this case, really breeding for health and constitution.

White Dorkings.

The White Dorking, as already intimated, was in all probability the purest representative of the original race, unless we except the Red, at the time when Bonington Moubray wrote in 1815. It alone—again perhaps excepting the Red, which was never mentioned in those days—from the first always bred the fifth toe, and there are observable certain differences in carriage, and a greater elegance of form, which is usually rather lighter, and without that massive heaviness which probably came largely from the Surrey fowl. There is little doubt that at one time the breed also received a little crossing with Game, and it is curious that some strains to this day lay eggs of a delicate pinky or French white shade; but certainly no cross has taken place for many years.

In this variety alone, a rose-comb is essential. This should stand up well, with a long and straight leader behind, and be of good shape generally. This is perhaps the most difficult exhibition point, as a large breed like the Dorking requires pushing on somewhat,



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SILVER-GREY DORKINGS

while on the other hand any meat forcing tends to excess or deformity in the comb. Free range gives the best all-round results; and on the whole, taking comb, and size, and plumage into consideration, there is no variety in which ample range is more important to a really high exhibition standard.

Breeding White Dorkings.

In breeding White Dorkings the chief points to keep in view are good combs and silvery-white colour. To care for the latter point, Mr. Cresswell again attributed the great gain in hardiness which he also reported in this breed. Really first-class specimens of both sexes will breed chickens of both from one pen; but as usual in white breeds, if such are not obtainable, silvery-white hackle and neat comb, with good style, is the principal essential in the cock, especially for breeding cockerels, while size may be a little sacrificed. Hens must be large and roomy in any case; and any peculiarity in style or carriage of tail is likely to be more conspicuous in the cockerels. Mr. Cresswell added the curious and remarkable experience that many of his birds laid so incessantly that they never grew broody at all, so that he had to fall back on other hens as foster-mothers. The breed was always known as the best layer among the Dorkings; but this modern development is very interesting, and a remarkable testimony against breeding for exhibition always spoiling the useful qualities of poultry. The deep square body of the Dorking in general should always be sought for in mating up breeding stock.

The White Dorking was formerly inferior in size to its Dark relatives. As Miss Fairhurst, a very successful exhibitor forty years ago, pointed out at that time, White birds often *appear* smaller by the side of Dark ones when they are not really so, and there is no doubt that in mixed classes they often suffer unjustly from that cause; but the White Dorking cock of those days scarcely ever exceeded 8 lbs. to 10 lbs. Mr. John Martin, however, by a cross with Dark Dorkings, effected a startling increase in these weights. He put a large Dark cock, the darkest he could find, to White hens, the produce being cuckoo-colour. These birds were crossed back to the White, from which came many Whites, and after that all was easy. The produce of this experiment was dispersed soon after, on Lady Holmesdale's retirement, and at her sale several very large birds were brought to the hammer, one White cock weighing over 12 lbs., and winning at nearly all the winter shows following. Years afterwards, Mr. Martin repeated the experiment, using his rose-combed Palace winner as the sire, and among the produce this time was a cockerel we knew well, which weighed 10½ lbs. at eight months old. The blood of some of these crosses is to be found in many of the White Dorkings of to-day, but the entire gain in size has not been kept up, nor is it desirable that it should be, the very huge birds being neither the best layers nor the best table-fowls.

Cuckoo Dorkings.

There is yet one more recognised variety, known as the Cuckoo Dorking, this being the old English word for the blue barred plumage called by Americans Dominique, and seen to its greatest perfection in the Plymouth Rock. Cuckoo Dorkings have scarcely been known out of Surrey, and clearly originated in the crossing for table poultry of dark and white varieties, the colour always appearing when much crossing of that kind takes place. The birds, as we have seen them, have always been somewhat small, but are generally reported as hardier than the more orthodox types under ordinary conditions, and are said also to be more juicy in flesh. The variety has never been a favourite, Meall writing of it even in 1854 that "it is very little known and still less admired," and it is a good proof of what happens to a breed when fanciers do not meddle with it: instead of being better than the others, because "unspoilt" by them, it is become practically extinct. In 1871 and 1872 classes for Cuckoos were offered at the Crystal Palace show; but there were not sufficient entries, and similar attempts to encourage Cuckoos have been made since with no better result.

One reason for this want of popularity is probably that there is little real *breed* in this colour at all. If there were, continual breeding by only one or two breeders, must long since have produced unusual delicacy of constitution; but all concerning which we have been able to make inquiry, have proved of very recent origin, though at an earlier period Mr. Elgar of Reigate, and one or two others, did endeavour for some years to breed them pure. The fact is that the colour is continually springing up here and there from crosses, and to this is owing its hardihood. But such constantly re-made and raw stock is peculiarly liable to red or gold or black or white feathers, and gives so much work to a breeder, that there is little inducement to persevere. The few specimens to be seen now and then usually appear at shows where, after the Dark and perhaps another variety or two, there are open classes for "Any Other Colour."

Merely as market poultry, the Cuckoo Dorking is a good fowl enough, and its hardy constitution, derived from recent crossing, enables it to be kept in some situations where the more recognised varieties would fail. If it is ever bred, the same care will be needed to exclude black, or red, or white feathers, and to keep up a "balance" of colour, as in the case of barred Rocks or any other barred varieties. But many years of careful breeding would be required before the plumage reached this point, and the variety really is not worth it, being in no respect superior to the Scotch Grey.

As a table fowl it has been very freely asserted of late that the present Dark breed is by no means so good as fifty years ago. This is partly truth and partly error, and there can be no doubt that some care is required in selecting the better types. The points that have most needed attention during the last few years have been width of back and length of breast; we have seen many dead chickens at exhibitions of table poultry which were quite narrow in the shoulders and short in the breast-bone. To a great many novices such short-breasted birds, as Mr. John Martin remarked many years ago, may appear round and plump, but they are not good Dorkings; as described in the Standard, the body should be of "*long* rectangular shape viewed sideways," showing a long keel, as delineated in Fig. 120. This imaginary rectangle should always be looked for, and is the key to the true form of this breed.

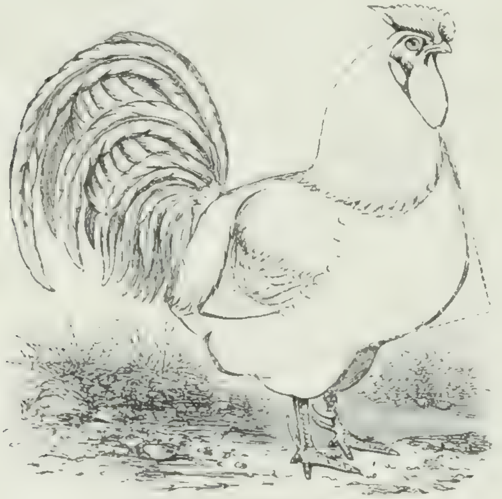
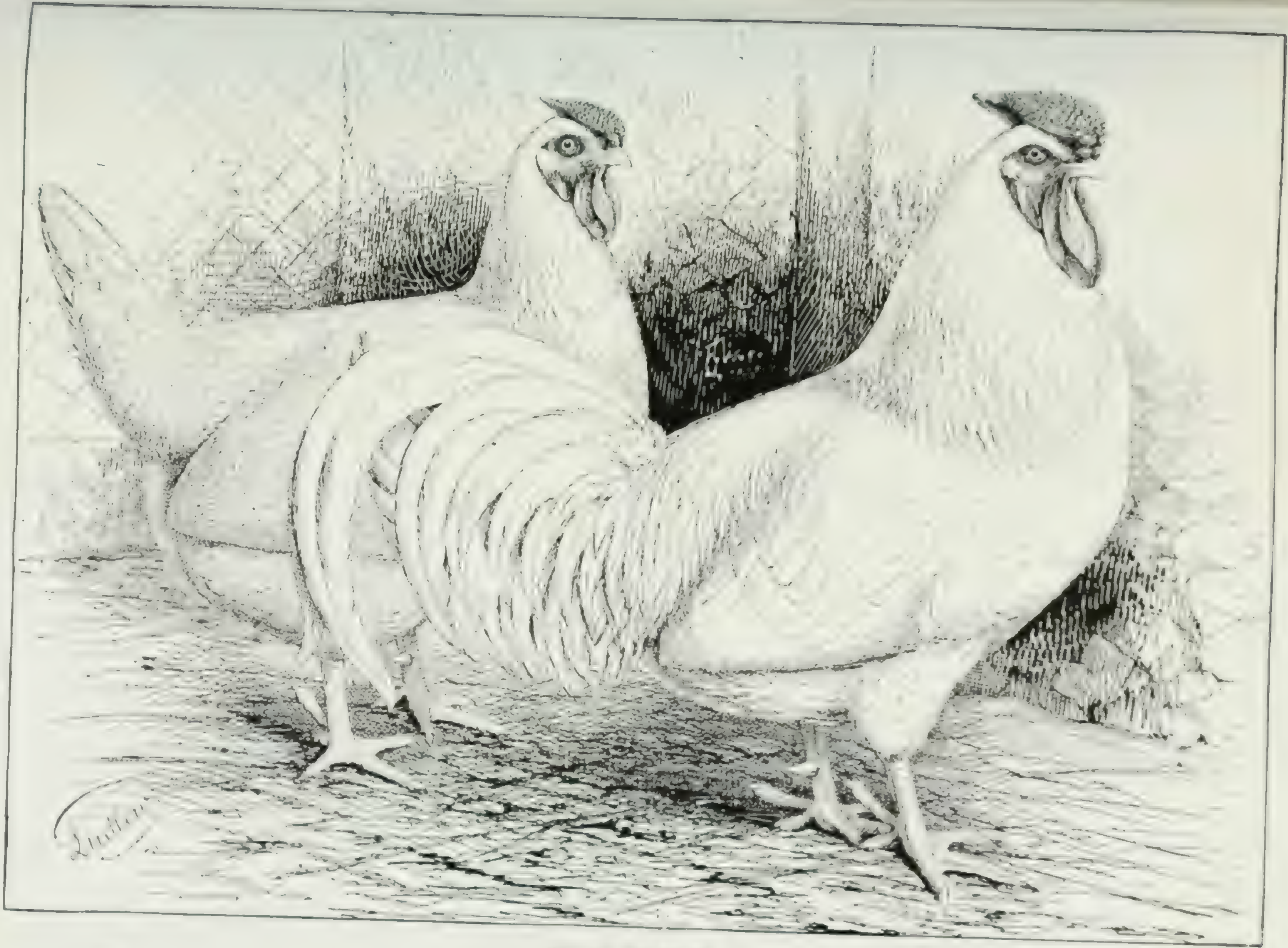


Fig. 120—Dorking Shape.

The quality of the flesh also needs attention, being unmistakably "short and dry" in character in some strains, though white enough. This want of quality, again, has been said to be due to Asiatic crossing, which several writers have alleged to have impaired it, and to have destroyed the old "whiteness" of flesh. That is an error, and indeed some of the evil has arisen from looking too much to mere colour of flesh, instead of real quality. We have already seen that the best results in table fowl are attained by grafting some amount of yellow blood upon white-fleshed birds; but few people seem aware that the original and purest Dorkings, many years before poultry shows were even thought of, were *not white* in flesh. In the work already referred to, published in 1815, Moubray writes of the White Dorking of that day, the only pure breed in his opinion, that "the white is probably not so pure as that of certain of the dunghill fowls, nor is the colour of the flesh, that inclining to a *yellow or ivory shade*." This "ivory shade" it was which gave tender juiciness to the original fowl, exactly as we find it to-day. Experienced Sussex breeders can tell by the "touch" of a live fowl what the flesh is likely to be; and this test should be freely used in selecting stock for breeding Dorkings.

One great recommendation of the breed is the *early* growth of the chickens. If a Dorking and a Brahma are hatched in the same brood, while probably both may make about the same ultimate weight, the Dorking will simply run away from the other during chickenhood, and will also be a plump table fowl, whilst the other is still the scrawny framework of one. It has the property of imparting this quality in more or less degree to all its crosses, which makes it so valuable for crossing purposes. With the Brahma it produces a very hardy chicken, that grows fast and makes a fine carcase, slightly coarse-looking perhaps, but juicy in flavour, and a great favourite in Sussex. Other crosses are very similar. That with the Houdan is not so large, but very fine in flesh, and remarkable for growth at the earlier ages. It will not fail to be noticed that the latest table fowl produced in France, and which has largely displaced older breeds there—the Faverolles—is a compound of Brahma and Houdan with the English Dorking. The cross with the Indian Game has been already dwelt upon at great length in former chapters of this book.

Considerable difference of opinion has been expressed in preceding notes as to the time for hatching Dorkings; but this in truth arises mainly from a mixture of utility and exhibition considerations. Considered as useful stock alone, there is no doubt whatever that from the end of March till the end of April, or even up to early



WHITE DORKINGS.

May, is the best period to get chicks out. By not breeding earlier, constitution is kept up, and the early growth of the chickens makes even May birds quite ready for the great shows of the year. Chickens hatched at this season thrive well and feather well, and when bred from parents not fagged by too much showing or exhausted by winter breeding, would not strike anyone as more delicate than usual, and are very often quite good layers. We mention laying in this connection, because it is intimately bound up with it, for the Dorking has an undoubted weakness in regard to over-exhibition. As already intimated by Mr. Goodfellow above, the males will not stand much showing with impunity; beyond a very few times seriously impairs their breeding power. Mr. Smyth also, it will be noticed, expresses his strong preference for males that have been but little exhibited; and at the Poultry Conference of 1899 Mr. Cresswell, in reporting upon the great gain in hardiness which he had found, laid stress upon the fact that he was only an exhibitor at a few of the great shows of the year. Such remarks should be well considered.

It will have been gathered from this, that Dorkings are not adapted for close confinement. On the smallest runs which can be kept in grass, they will do very well, but it is on free range that their good qualities come out best. In small suburban runs they often sicken and pine away. A friend once reported to us that he had kept them in health in quite a small run—about 20 by 10 feet we think, with a shed along one end—by perfect cleanliness and ample green food. But his idea of cleanliness was very different from that which satisfies nine people out of ten in such circumstances, and to such scrupulousness his success was probably due.

In one respect modern breeders have made great improvement in the Dorking, and more especially in the Dark variety. In the earlier stages of the breed, the fifth toe was not only very uncertain, but liable to all sorts of deformities and gouty swellings, and "bumble-foot" was but too well known as a constant trouble; we can remember seeing one or the other in almost half of the pens. Breeders seem to have thought that malformed and swelled toes and bumble-foot were natural defects, which simply had to be endured and made the best of. With more knowledge they have acted differently; and by penalising such birds more heavily in the show-pen, and discarding them from the breeding-pen, both evils have now been so nearly eradicated that it has become rather rare to see either malformed toes or a case of bumble-foot at a first-class exhibition. The greatest care should be taken to select for breeding none but birds with sound and perfectly-formed feet, the extra toe pointing well upwards.

In regard to combs, the rose or single comb is optional in the Dark variety only, while rose combs are demanded in Whites and Cuckoos, and single combs in Silver Greys. During the early days of exhibition one comb was as common as the other in Darks, with a preference on the whole for rose, as more like the original White breed; but a great many of the rose-combed birds were very coarse about the head, and single combs grew in favour, till in 1890–5 the rose-comb had practically disappeared. Since then there has been some revival of this form of comb, Mr. A. C. Major having exhibited some very fine specimens. It is to be regretted that many single-combed cocks have had such enormous, beefy, overgrown combs as to be practically sterile, and requiring to be dubbed before they are any use for breeding. There can be little doubt that this monstrosity was introduced by the Spanish cross already referred to; for the original single-combed Dorking was by no means a heavy-combed bird. It is to be hoped that breeders and judges will set their faces against such undue development, and strive for the "moderately large" combs laid down in the Standard. In a heavy breed like this such a source of weakness is especially prejudicial.

Judging Dorkings.

In the earlier days of poultry exhibition the Grey or Coloured Dorking was judged without any reference to colour or plumage, except that the three hens or pullets then shown together were expected to make some fair match with each other. This led to many specimens being exhibited over-fat. With the introduction of the very dark plumage by Mr. Douglas' Asiatic cross, there came in more and more preference for that colour, birds so marked being as a rule larger and finer than those of other colours. At the present day reaction from the older idea has gone so far, that the Standard now only recognises the very dark, "almost black" colour of plumage. This is distinctly to be regretted, in the interest not only of white feet, but of a somewhat more medium though still dark colour, which is very often shown with success, and certainly neither is nor ought to be penalised by any deduction.

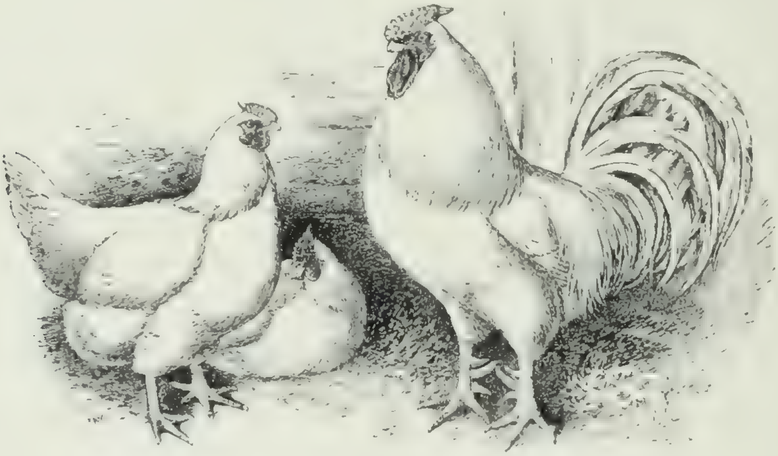
The shape or symmetry of the fowl should be the same in all varieties. For many years the White has been as a rule more tall and reachy than the others; but this has gradually become modified, and Mr. Ludlow's ideal is undoubtedly, as an ideal, correct. In classes where all colours compete, it should be remembered that Whites of equal weight and real size will generally appear a pound smaller than darker colours, and this should be allowed for. Good condition, or any appearance of being jaded from over-showing, should receive special attention.

THE SUSSEX

Sussex Fowls.

In the first impression of this work a hope was expressed that before it was too late some effort might be made to preserve from extinction the genuine *old* Surrey and Sussex fowl, which for years had furnished the very best table fowls to the London market, and which was really an ancient race, quite different from the various mongrels now prevalent in the district. We were glad to see that hope realised, and in July, 1903, steps were taken to form the "Sussex Poultry Club" for the breeding, exhibition, and standardising of this super-excellent old breed. By May, 1911, the Club included nearly 300 members. The birds were first exhibited under their proper name at the Royal Agricultural Society's Show in June, 1904, but, as might have been expected, were at that early date very irregular both in type and marking. But later, at the Lewes Show in November, 1904, the entries reached 163, and excited something like a mild sensation. The hon. secretary of the Club is Mr. S. C. Sharpe, Brookside, Ringmer, Sussex.

That this old four-toed Sussex breed was one of the ancestors of the Coloured Dorking is absolutely beyond doubt. The late Mr. Harrison Weir took another view, but it is based upon statements and personal memories of men, each of whom thinks his own stock the only true one; whereas Bonington Moubray's evidence in 1815, and Nolan's in 1850, is contemporary and conclusive. It was of many colours, including speckles, browns, reds, and lighter plumage. From these the Club has selected for its standard colours a red, speckled, and light; the latter being marked like the Light Brahma. There is also a Brown Sussex Club, which supports that colour. The Whites, first bred by Mr. Godfrey Shaw as Albions, have been abandoned to the all-devouring Orpington interest; but it is a pleasure to observe that the speckled (which that interest also claims to appropriate) has been retained for the true type, and the county of its origin.



White Dorkings.

As regards type, the most distinctive characteristic of the Sussex fowl is the width and flatness of shoulders and back, in which it stands out from all other breeds. In shortness of leg, length and depth of body, and fulness of breast, it resembles the Dorking; but in this width and flatness of back it stands alone, and this feature makes the body appear almost short when viewed from above, though the breast is really long. This character is laid down in the Standard, and we are glad to observe that twenty points are allotted for true type, and twenty-five for size, as the breed is one for the table above all. The other main points are short white legs with only four toes, thin skin, and juiciness of flesh.

The Sussex fowl is hardy, both as a chick

'Light Sussex Cockerel.

and later on, and the hen a very good layer. She is also a capital mother, and can shelter a very large brood, twenty or more chicks being often committed to one bird in its native county. But the commanding merit of this old British strain is as a table fowl, in which it surpasses every other breed on earth, even the Dorking itself. Both have white meat, and plenty of it; but the Sussex is by almost universal testimony superior in tenderness and juiciness whenever compared with the Dorking of to-day. Meall in 1854 is evidence that it was so at that date, when the race was plentiful; and it is noteworthy that since its remnants have been gathered together, Mr. Haffenden has won at Smithfield (December, 1904) first and cup in the class for any variety, with a pair of dead pullets of this breed. Many chickens will fatten in three weeks.

Mr. Lewis Wright's observations in our last edition we are now fortunately able to supplement by the following notes from Mr. S. C. Sharpe, hon. secretary of the Sussex Poultry Club:—

"Specialist clubs should have every possible support from all who are interested in the welfare of poultry, for the progress of the Sussex shows the good work that such bodies can accomplish, and yet only a few short years ago this most useful breed was scarcely known outside its own county, and not even there as an exhibition bird.

"The Sussex Poultry Club, with which I have been connected since its inception, now has two sister clubs affiliated with the British Club, one in Quedlinburg, Germany, Herr Heumann being the hon. secretary, and another club in America, at Hackensack, New Jersey, Mr. W. H. Bratt being the hon. secretary. Both of these clubs are doing good work, and at the shows held in their respective countries some very good specimens may be seen.

"Of the three varieties of Sussex, the Light is my favourite—we have a standard for three varieties, viz. Light, Red, and Speckled—and there is no doubt whatever that these birds have been bred in the county of Sussex for a number of years before the Club was formed, and bred true to colour and type, too, and now that they are more widely known they have become a very popular fowl both in the show pen and as a useful utility bird.

"The Lights are capital winter layers; in fact for three consecutive years they have proved themselves best out of fourteen breeds

Light Sussex Pullet.

which I keep at the Agricultural College Training Farm, Uckfield. As mothers and sitters they are hard to beat, bringing up large broods of chickens at all times of the year, and are used extensively in East Sussex for rearing the early spring chicken; and although good sitters, they are not so continually broody as some breeds I know.

"The chickens from the Lights are easy to rear and can generally be brought up without much trouble even in the depths of winter; but I have frequently heard people say that the eggs laid by the Lights are rather small. My answer to this is, any breed which lays a large number of eggs without becoming broody will decrease in size of egg as time goes on, and it always speaks well for the egg-producing powers of the bird when this happens. I notice that in the early part of the season the Lights lay a very nice-sized egg, but as the season advances the egg becomes somewhat smaller.

"In breeding the Lights it is difficult as yet to get the cocks free from brassiness; so many which we see at the shows have a decided yellow tinge, which is not noticeable in the hens. The particular fault in colour of the hens is generally insufficient neck hackle; or, if they have a good hackle, then the trouble is dark under-colour. When, however, we are fortunate enough as to breed them without these minor faults, they will do well in the show pen, and they are certainly very handsome birds.

"The Reds have not found quite so many supporters, although they are a grand breed, and when the colour is good—that is, a deep red, with black in flights, tail, and neck hackle —they look very smart. The red colouring should be dark and deep, like our fine Sussex cattle. The Reds are good layers and make useful mothers, taking large broods and doing them well. I am pleased to note that the Irish members of our club, of whom we have a good number, are taking up the Red variety, and I am sure that they will find them excellent from all points of view.

"The Speckled Sussex are perhaps the oldest variety, and certainly are handsome in appearance, but not easy to breed; indeed, where, in breeding a bird, three colours have to be evenly intermingled, it is not possible to get a heavy percentage of them winners. The colours are dark brown, black and white, and when these colours are produced evenly on a massive, well shaped bird it is certainly something worth looking at and difficult to beat in the way of poultry.

"I hope that the Sussex may still be taken up by breeders in all parts of the world, and I am sure that those who want a useful as well as a show bird cannot do better than breed them."

DORKINGS

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Large and broad. *Beak:* Stout, well proportioned, and slightly curved. *Eyes:* Full. *Comb:* Single or rose in Darks, single in Reds and Silver-Greys, rose in Whites and Cuckoos. The single comb should be moderately large, broad at the base, and firmly set on the head, of perfectly upright carriage and evenly serrated, free from thumb marks or any excrescent growths such as side spikes. The rose comb should be moderately broad and square fronted, and narrowing behind to a distinct and slightly upturned leader, covered on top with small, coral-like points of even height and free from hollows. *Face:* Smooth. *Ear-lobes:* Moderately developed, hanging as nearly as possible about one-third the depth of the wattles. *Wattles:* Large and pendant, and free from any excrescent growths.

Neck.—Rather short, and covered with abundant hackle which should fall well over the back, giving the neck the appearance of being very broad where it joins the body and tapering to the head.

Body.—Deep and massive, and as large as possible, long, rectangular shape when viewed sideways, and tightly feathered. *Breast:* Broad and well rounded, with long and straight breast-bone. *Back:* Broad and moderately long, with full saddle, inclining downwards to the tail. *Wings:* Large, carried well up, and close to the sides.

Tail.—Full and sweeping, and carried well out (a "squirrel" tail being objectionable), with broad and well-curved sickles and abundant side hangers.

Legs and Feet.—*Legs:* Short and strong, the thighs well developed, but almost hidden by the body feathering, and the shanks stout and round (square or sinewy bone being very objectionable), set well apart, and free from any sign of shank feathers, with the spurs set on the inner side and pointing inwards. *Toes:* Five on each foot, round and hard ("spongy" feet to be guarded against), the front long, straight, and well spread, the fourth distinctly apart from the fifth and inclining towards the ground, the fifth coming away distinctly from the shank and turned up the leg.

Carriage.—Stately, with the breast forward.

Weight.—From 12 lb. to 14 lb.; cockerel, from 9 lb. to 10 lb. The Red, 8 lb.; cockerel, 6 lb.

HEN

Except that the single *Comb* should fall over one side of the face, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—From 9 lb. to 10 lb.; pullet, from 7 lb. to 8 lb. The Red, 7 lb.; pullet, 5 lb.

COLOUR

Beak : White or horn, dark horn permissible in Darks. *Eyes :* Bright red or yellow iris, the former preferred. *Comb, Face, Wattles, and Ear-lobes :* Brilliant (or coral) red. *Legs and Feet* (including toe-nails) : Dead (or snow) white, the former free from red or pink down the sides, and the toes free from such colours in the webbing or any other part

THE CUCKOO

Plumage.—Light blue-grey ground, each feather barred across with bands of dark grey or blue, the markings to be uniform and the colours shading into each other so that no distinct line or separation of the colours is perceptible.

THE DARK (OR COLOURED

Plumage of the Cock.—*Hackle and Saddle :* White or straw ground, more or less striped with black. *Back :* Various shades of white, black and white or grey, sometimes mixed with maroon (bronze objectionable). *Wings :* Bow, white, or white mixed with black or grey ; coverts or bar, black, glossed with green ; secondaries, white on outer web, black on inner web. *Breast and Under-parts :* Jet black, white mottling not permissible. *Tail :* Black, richly glossed, a little white on primary sickles permissible, but white hangers decidedly objectionable.

Plumage of the Hen.—*Hackle :* White or pale straw, striped with black or dark grey. *Breast :* Salmon-red, each feather tipped with dark grey verging to black. *Tail :* Nearly black, or rich copper with the outer feathers slightly pencilled. *Remainder of Plumage :* Nearly black, or approaching a rich dark brown, the shaft showing a dull white, and each feather slightly pale on the edges, except on the wings, where the centre of the feather is a brown-grey ground covered with a small rich marking, surrounded by a thick lacing of the black, and free from red.

THE RED

Plumage of the Cock.—*Hackle and Saddle :* Bright, glossy red. *Back and Wing-bows :* Dark red. *Remainder of Plumage :* Jet black, glossed with green.

Plumage of the Hen.—*Hackle :* Bright gold, heavily striped with black. *Tail and primaries :* Black or very dark brown. *Remainder of Plumage :* Red-brown, the redder the better, each feather more or less tipped or spangled with black, and having a bright yellow or orange coloured shaft.

THE SILVER GREY

Plumage of the Cock.—*Hackle :* Pure silver white, free from straw tinge or rustiness, a very narrow stripe of grey in the lower feathers being permissible, although not desirable. *Back and Saddle :* Pure silver white, free from striping or yellow tints. *Wings :* Coverts and bow, silver white ; bar, lustrous black, glossed with green or blue ; secondaries, white on outer web, black on inner web, with a black spot at the end of each feather, and when the wing is closed the corner appearing snow white with a black upper edge ; primaries, black with a white edge on outer web. *Breast, Under-parts, and Tail :* Jet black, free from any white mottling or grizzling, although in old cocks a slight grizzling of the thighs is not a fatal defect.

Plumage of the Hen.—*Hackle :* Silver white, especially on the cap, the lower hackle striped with a narrow line of black, a copper-coloured hackle not allowable. *Breast :* Rich robin red or salmon red, shading off to ash-grey on the thighs. *Body :* Clear silver grey, finely pencilled with darker grey (the pencilling following the outer line of the feather), and free from any red or brown tinge, or any black dapplings. (The effect may vary from soft dull grey to bright silver grey, an old-fashioned grey slate best describing the colour.) *Tail :* Darker grey, inside feathers black.

THE WHITE

Plumage.—As white as snow, and free from straw tinge.

SCALE OF POINTS

	Dark	*Silver Grey and Red*	*Cuckoo and White*
Size	21	15	15
Symmetry	20	20	20
Colour	18	24	15
Fifth toe	15	15	15
Condition	10	10	10
Head	8	8	17
Feet ; condition of ..	8	8	8
	100	100	100

Serious defects : Other than five toes ; legs other than white or with any vestige of feathers ; spurs outside the shank ; single combs in Whites or Cuckoos, rose combs in Silver-Greys or Reds ; any coloured feathers in Whites ; very long legs ; crooked or much swollen toes ; bumble feet ; distinct double toe-nails ; round back, twisted breast-bone, wry tail, or any other actual deformity.

SUSSEX

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Of medium size. *Beak :* Short and strong, and well curved. *Eyes :* Full and bright. *Comb :* Single, of medium size, upright, evenly serrated, and fitting closely to the head. *Face :* Smooth. *Ear-lobes and Wattles :* Of medium size.

Neck.—Of medium length, and furnished with fairly full hackle.

Body.—Broad, deep, and fairly long. *Breast :* Square, and carried well forward with long and deep breast-bone. *Shoulders :* Wide. *Back :* Broad and flat. *Wings :* Carried closely to the body.

Tail.—Of moderate size.

Legs and Feet.—*Legs :* Short and rather wide apart, the thighs stout and the shanks strong and free from feathers. *Toes :* Four on each foot, straight, long, and well spread.

Carriage.—Graceful and erect.

Weight.—9 lb.

Plumage.—Close.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—7 lb.

COLOUR

THE LIGHT

Beak : White or horn. *Eyes :* Orange. *Comb, Face, Wattles, and Ear-lobes :* Red. *Legs and Feet :* White.

Plumage.—Pure white, with markings as follows : *Neck - hackle :* Striped with black. *Wings :* Black in flights. *Tail :* Black, the cock's coverts slightly tipped with black.

THE RED

Head points (except *Eyes :* Red or brown). *Legs and Feet :* As in the Light.

Plumage.—Except that the colour is brown (dark or chestnut), this variety is similar to the former. In the cock there is a greater depth of colour on the saddle and the wing-bow, which are glossy.

THE SPECKLED

Head points (except *Eyes :* Orange or brown). *Legs and Feet :* As in the Light.

Plumage of the Cock.—Rich red brown ground, with black and white markings. *Hackles:* Striped, with black and tipped with white. *Wings :* Bow, red, or nearly so ; primaries, white, or nearly so. *Tail :* Black and white. *Remainder of Plumage :* Brown, white, and black, evenly distributed, and giving a speckled effect.

Plumage of the Hen.—*Wings :* Bow, brown, white, and black ; flights, white. *Tail :* Black, white, and brown. *Remainder of Plumage :* Brown, white, and black, evenly distributed and giving a speckled effect.

SCALE OF POINTS

Size	25
Type	20
Colour	20
Legs and feet	15
Head	10
Condition	10
	100

Serious defects : Rose comb ; feather on shanks ; other than four toes ; wry tail ; any deformity.

Speckled Sussex Cockerel.

CHAPTER XXV.

SPANISH.

THIS fowl stands at the head of a group which almost certainly did come to us from the Spanish Peninsula, all the names of the nearest kindred races testifying to the same origin, whilst there is ample evidence that fowls of the same type are still found in that country. But the general type itself is found over a much wider area. The smaller size and yellow legs of the Leghorn family are minor differences, as are various colours of plumage; but all round the Mediterranean—in Greece, and Asia Minor, and Algiers, and Egypt, as well as in Italy and Spain—are found fowls which, in their large single combs, sprightly carriage, absence of the incubating instinct, and generally more or less white ear-lobes, evidently belong to one great family.

This wide distribution around the Great Sea of a race with such characteristics, and especially with the peculiarity of not incubating, is remarkable, since such a modification of instinct is necessarily the fruit not only of long domestication, but of methodical selection for eggs as a chief product. Some have traced the loss of the instinct to centuries of artificial incubation in Egypt, and this may have had some influence; but we are disposed to attribute more effect to the prevalence of the Roman Catholic religion, which permits the use of eggs when flesh is forbidden, round the northern coasts of the Sea, where the type has become most marked. We find some corroboration of this idea in the fact that in other parts of Catholic Europe races of non-sitting layers have been developed, though of a different character in other respects. It is, however, needless to discuss these questions further, and we may proceed to describe in this chapter the oldest representative of this highly useful family of fowls.

History of Spanish.

The white-faced black Spanish has been much the longest known of these breeds, and it is perfectly easy to understand how it probably came to us direct from Spain. In the days of Philip the intercourse between this country and Spain was very great, so that Spanish and Portuguese wines almost drove French vintages for a time from the English market. It is further to be observed that at a later period, when Spanish were already known and bred in England, to a somewhat rough or cauliflower type of face, a second introduction of birds with smaller and smoother faces came from Holland, precisely that district of Europe which had been most over-run by the Spanish armies under the Duke of Alva. This crossing of strains considerably improved the English birds in face, as well as giving constitution; and two perceptibly different types of face remained till quite a late period, the late Mr. Henry Lane, of Bristol, having bred chiefly the heavier kind, and only commencing a year or two before his death to transform it into a smoother character, which he saw to be more and more preferred by the judges. Another change which has taken place is in colour of the legs, which were many years ago desired as light as possible, and occasionally were brought nearly white, being put in poultices before exhibition in order to improve their colour! Yet another transformation must be recorded in the comb of the cock, which at one time was expected to fall over on one side, while now desired straight and upright.

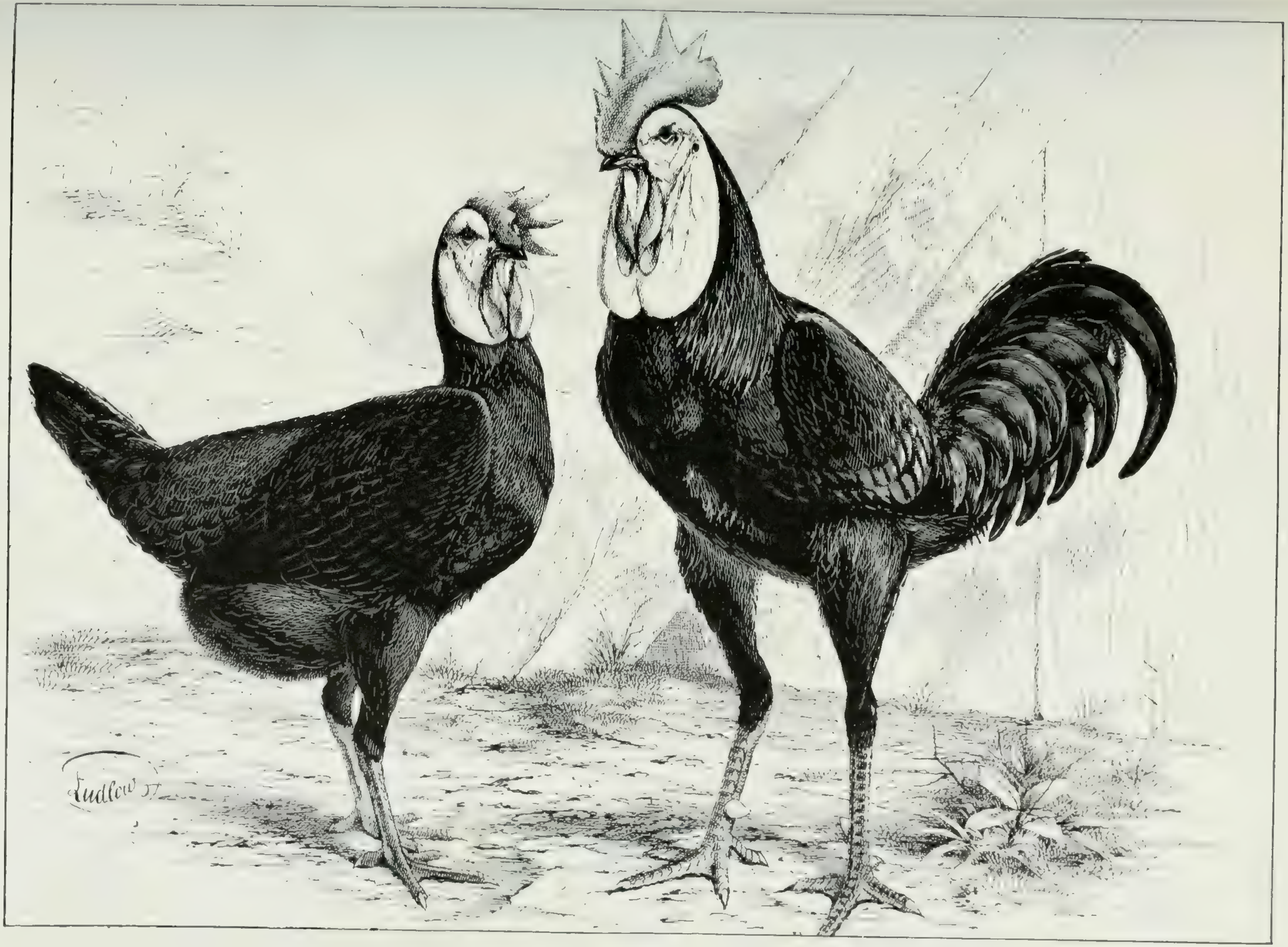
The greatest change of all, unfortunately, is recent, and to be seen in a decline of popularity which has no parallel in any other breed. In *The Poultry Chronicle* of early exhibition days, there were more advertisers of Spanish than of any other variety; no fowl was so well known; none had so good a reputation as a prolific layer of large white eggs, especially in and round London. Now the breed has a class to itself at very few shows, is extremely delicate, and we fear it must be confessed, but a poor layer. The change has often been attributed to breeding too much for white face; but the facts do not warrant such a conclusion. The real reason has been lack of breeders, and in consequence a lack of blood, and an amount of in-breeding that has been ruinous. For a time, the city of Bristol had a circle of Spanish fanciers almost impossible to beat, headed and founded by the late Mr Rake; and we well remember, at the first revived Bristol show of 1867, where the chief of these did their best, how four pens (trios) shown by Messrs. Lane, Parsley, Roué, and Jones, were taken out and placed in adjoining pens, and placarded by the judges as "the four best pens of Spanish ever seen together." It was difficult to say which was really the best of these. We have never seen better faces since, very seldom even so good, and certainly never four exhibits so good; yet at that time the breed was still a good layer. There were besides those just named, the late Mr. Rodbard, and Mr. Hyde, and one or two others. So long as these breeders could exchange, and so get blood, the breed did not suffer in spite of the faces. But the phalanx died off or were dispersed; and when the stock got into a very few hands, at wide distances, so that they could not conveniently exchange blood, and these used more artificial heat and began to trust more and more to "exhibition arts" instead of breeding skill, constitution failed, and the breed went down. Another cause of failure was the breeding of too large combs, remarked upon by the late Mr. Teebay in 1872. To keep these straight one of the Bristol breeders invented the comb-guard, which removed one check there had been upon size of comb; and such combs entailed more or less sterility, as mentioned in a previous chapter. From this cause also constitution suffered; until now we see what can only be described as absolute poverty of blood clearly shown by the most certain of all its signs, a legginess and weediness of build which are considerably greater than formerly, and are by no means shown at their worst in the illustration.

Yet the late Mr. Teebay wrote in 1872 a most interesting account of how he, a breeder and successful exhibitor for more than twenty years, had found Spanish a *hardy* breed. He hatched them in April and May, put them out with the hen, and never took them in after; and as soon as the birds were able to fly they perched in the trees, right through the winter. They feathered well, and grew well, and the cocks' combs kept firm, and even stood frost far better than those kept indoors. The old birds roosted in houses built for single horses, with the doors wide open except on very severe frosty nights. So kept, they were not tender, moulted well, laid well, and lasted well. Of course, young birds thus kept required to be kept penned up in a rather warm closed house before exhibition, and old birds needed at least three weeks of this to bleach the faces and soften the white; but the really good specimens readily responded to this treatment, and Mr. Teebay exhibited in his day some of the best Spanish ever seen. He always preferred to breed from two or three year old hens rather than pullets, the chickens feathering more quickly; and his general methods might be found worthy of repetition by some breeder desirous of removing the present reproach of this fine old race of poultry.

Characteristics of Spanish.

The Spanish cock should be tall on the leg, though not so stilty as most of the present day. The neck is long and gracefully arched, and the head carried high, with breast prominent; this proud carriage is apt to suffer from an overgrown comb, which is, however, less seen now in Spanish than in Minorcas. The shanks are slate colour or lead colour, but get lighter in old birds—almost a pale lavender in some cases. They are bred lighter now than some years ago, owing, we believe, to the more artificial regimen already alluded to. The body should narrow to the tail, somewhat like that of a Game cock. The tail should be full but not carried squirrel fashion. The plumage all over a rich black, as lustrous as possible. The chief points are, however, contained in the head and face. The beak is large and of a deep horn colour, and the head, as a whole, large, being both long, broad, and very deep in the side, with large eyes, which should be free and open in the midst of the face. The medium single comb should be perfectly upright, firm, and straight; rather thin at the edge, but thick at the base upon the broad skull; fine and smooth in surface, with a few broad serrations, not many narrow ones; and rising from the beak between the nostrils. But the chief feature of the bird is the white face. Both face and ear-lobe should be pure white, and in texture like the finest white kid; smooth, or free from ridges and folds, and leaving the eye unobstructed. The white should reach well on to the beak in front, rise over the eye close to the base of the comb, and extend well towards the back of the head, the further over and behind the ear the better, and sweeping in an unbroken curve towards the back of the neck. The large white ear-lobe should be long, open, and broad, lying spread out flat or free from folds, and not at all narrowing at the bottom, but keeping up the width till rounded off; thence the line comes up to join the wattles in front. These are long, thin, and florid, the inside of their upper parts and the skin of the throat between being white.

The hen is very similar in most points except that her comb falls entirely over one side of the face. The face itself is, of course, smaller than in the cock, but of the same general character;



SPANISH.

and there should be no apparent line or division between the face and the ear-lobe. The wattles are rather smaller than might be expected, and are preferred small and thin.

Breeding Spanish.

It is probable that the constitution of Spanish might be yet revived by systematic rational treatment, the total abandonment of heat except in actual frost, and seasonable breeding, which does not exhaust the stock in cold weather. The breed is not one at all adapted for early showing, and Spanish should not be hatched till April or May; if this be done, and hens chiefly bred from, the chicks will feather better and grow up much stronger. They do well in brooders kept carefully from any excess of heat, and the present delicate stock is often helped a great deal by a little old ale and shredded underdone meat once a day until fledged. Care of the combs has already been treated (pp. 200, 212-13).

In breeding for the main point of face, much judgment is required. It is better, as a rule, to mate smooth-faced cockerels, even if somewhat smaller in face (as such birds often are) with large and rougher-faced hens, than to employ the contrary plan, the produce of a male at all rough in face being very uncertain. Anything at all like a raw cross, even of good blood, often works apparent havoc in the faces; but nevertheless we would use a good bird in this way, in order to get, if possible, more constitution; as breeding back to "line" will make matters right in another generation or two. The greatest fault of the faces at present is not being flat and free from folds: so many are folded, wrinkled, or doubled. Something can be done to avoid this, as already indicated (p. 213), by taking symptoms early, and treating by gentle extension at frequent intervals, but the root of the mischief is in selecting stock too broad in face on both sides. This tends to produce more face than the surface can really carry, and hence it folds or wrinkles up. Too thick or coarse a face is not only ugly in itself, but as the bird gets older very often grows so much as to obstruct the sight. In such cases a little has to be cut away with fine-pointed scissors. This operation, as we have seen it done, did not appear to cause much pain; but it is very easy to give a few whiffs of chloroform after missing a feed, and it is pleasanter to know that the bird really cannot feel. Fowls as a rule take chloroform exceedingly well.

It is not easy to determine the ultimate quality of the chickens while young, and we have known great mistakes made even by skilled breeders. The late Mr. Jones will be remembered by many as one of the most successful: on one occasion he had ordered a cockerel for execution early in autumn. His "man," however, thought differently, and as the bird had a particularly handsome comb, kept him on for a bit to see what he would come to. He began to make up hand over hand, and turned out the champion bird of the year! Faces which show red, or even any blush of it, at an early age may of course be safely discarded. The best birds usually look a curious sort of blue in the face while young, steadily clearing to white as they grow older. The difficulty comes more in judging the ultimate size of face, which sometimes turns out much more and sometimes less than might be expected.

Exhibiting Spanish.

In regard to treatment when grown, we knew all the Bristol yards well, and from their experience, collated and compared, acquired the decided conviction that Spanish did best of all in rather small grass runs, with a pretty ample shed boarded up two or three feet from the ground, in which they could be confined during windy or severe weather. When thus protected from exposure and kept for most of the day out of direct sun, they do not get very far out of show condition; but for ten days before a show require to be kept in a rather dark house or pen. Those at Bristol were mostly about 7 by 4 feet in floor space, boarded up about four feet from the floor, and netted above so as to be well ventilated; and they had enough of a sort of twilight for the birds to see their food and fly up to their perches. They would be let out for half an hour a day, when it was dull and mild; but not in the cold, or in the sun, whilst being got up for show; and heat was not used except in the coldest weather. Such a period of confinement in semi-darkness has great effect upon plumage as well as face, making it bright and glossy. Some of the present exhibitors of Spanish employ more heat and time and darkness than here described; but such was found sufficient by the breeders of the best specimens which the world has ever seen, and is much less tax upon the birds. Moreover, too much darkness bleaches the comb and wattles as well as the faces, giving quite a sickly appearance, as can be seen in exhibited Spanish to-day. By allowing more daylight and a little more time this can be avoided.

Previous to a show, the faces of Spanish need special attention. As already intimated, those of even good birds exposed to wind and sun generally become more or less reddened and harsh in texture; so much being rectified by confinement in semi-darkness, of from ten days for young birds, to perhaps thrice as much for old ones too long neglected. But the surface of the skin, being a special development, is always liable to eruptions and other surface blemishes, especially after any high feeding, and as a rule cooling diet as well as confinement is found necessary to get them into order. By almost universal consent all Spanish breeders gradually settled down to bread and milk in the morning. In the evening the Bristol men usually gave barley meal mixed rather dry, with a little whole corn; but wheat was dear and little used at that time, and since it has been cheap is found to answer for the evening meal very well, given in strict moderation: too much whole grain of any kind is not good for the face. Beside this, constant and ample green food must be supplied, for which lettuces or water-cress answer well; and twice a week a good pinch of sulphur may be given to each bird. This sort of feeding should be commenced at least three weeks before a show. Sometimes a good bird which has been neglected and over-fed will be found with an unsightly yellowish eruption or scab over a great part of his face. Such a face may need more time than can be given; but we cured a very bad case for a Bristol friend in about three weeks by giving 20 grains of Epsom salts twice a week, with 10 grains citrate of potash and 5 grains iodide of potassium in half a pint of water as drink, and gently sponging the face every morning and evening with sulphurous acid (B.P. strength*), carefully drying afterwards. Of course, a good Spanish fowl should never be allowed to get into such a condition as this, but have its diet reduced and the system cooled by medicine or more green food, before things have gone so far.

Preparation for Exhibition.

But the faces and lobes require more special treatment than this before exhibition. A pair of round-nosed steel tweezers or forceps must be provided, and with this the entire face is carefully gone over, plucking out each individual hair or plumule of the fluff or small hairy feathers, which will be found dotted over it. This removes what were apparently black specks, and leaves the face white and clear. The amount of these hair-like feathers used to differ a great deal in various strains, the largest-faced birds usually having the most; but the very coarse-faced ones have nearly disappeared. In trimming the face a fringe of feathers must be left between the top of the face and the base of the comb, to separate the white and red: if this is not done the bird is disqualified—not on the ground of fraud, but because it violates an understood convention, and looks ridiculous. Otherwise, this "trimming" of Spanish faces has long been accepted and allowed, though at one time the subject of much heated debate and vehement protest.

Most of such protests years ago against trimming Spanish faces, came from people who knew absolutely nothing practically about the fowl; but there was one notable exception. For years after all other recognised breeders, and all the judges, had admitted the practice, Mr. Alfred Heath kept up his protest, and refused to trim, and was always beaten in consequence, though having notoriously some of the very best birds, which constantly won so soon as they went out of his own hands. At length he publicly announced in several periodicals that, having done his best, and seeing the case was hopeless, he should henceforth do as others did, on the clear understanding that trimming was recognised, and not considered fraudulent. An important show occurred directly after this, and he came in an easy winner, though in a rather odd manner. His pen this time was in fact trimmed in such barefaced and extreme fashion as had hardly ever been seen, and provoked much laughter among other exhibitors, who "chaffed" him unmercifully about being "determined to do it 'proper' when he did set about it." One of the judges told us afterwards that they had been almost inclined to disqualify the pen on this account; not for fraud, but for its queer appearance: only they had an idea whose it was, and under the peculiar circumstances did not think it right to do so. The simple fact was that the other amused Spanish exhibitors were right, though not quite as they meant it. Mr. Heath (as he showed afterwards) knew quite enough to trim as artistically as anyone; but having said what he would do, like the thorough gentleman he was, he had carried it out purposely for this first time in a way that should fasten attention upon his pen, and so put the whole matter beyond dispute. The chief significance of this example and experience lies in what followed, and which shows, as we have before hinted in a different connection, that the real root of even much that may be really questionable, lies rather in an instinctive passion for perfection, than mere desire to reap advantage. A few years afterwards Mr. Heath wrote to us privately, stating that since trying the practice of trimming Spanish faces, he himself *now preferred it:* he had never, he said, seen the full beauty of his own birds before, and did not think it could be seen without trimming. And he frankly admitted that the present clear and open understanding upon the point (partly due, as his modesty omitted to state, to his own prominent action) had removed whatever objection he might formerly have entertained.

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* This prescription, since repeated by others, gave rise to a printed charge by one of those "humanitarians" who are so quick to think evil of others, of "atrocious cruelty" to which Spanish were subjected by having their faces "prepared by strong acids." Such as knew us, simply roared at this; but it may perhaps be as well to state that the "acid" is the solution in water of the gas formed by burning sulphur, and was once in vogue as a gargle for sore throat, for which it is still employed, being when so used absolutely tasteless.

Besides the trimming process, however, which is best deferred till a very few days before exhibition, Spanish faces require daily attention while penned up before a show, and some Bristol fanciers used to give it regularly to their few best specimens, and attached much importance to such daily regimen. Providing a very soft bit of sponge, a very soft towel, some mild soap, and a powder-puff with some powdered oxide of zinc (violet-powder will answer, but is not so dry), every day the face is gently sponged over with soap and *lukewarm* water (neither hot nor cold), going well into every crease. It is then as carefully and gently dried with the towel, again giving special attention to any creases, and finally puffed with the zinc powder. This is not, as some suppose, to leave white on the face, and before sending off care should be taken that no powder is left on; it is merely in order to thoroughly dry the skin. This treatment will be found to make a rapid and wonderful difference in the condition of the faces.

Convenience in regard to such constant manipulation, deserves a little thought, and different people manage in various ways. Some of our friends used to tie the bird's legs together with a piece of rag, and rest the body on the lap, with its breast-bone between the operator's thighs, and the legs hanging down in the centre: after once or twice the fowl is generally quiet thus. Others rested the bird in the same way, but passed a handkerchief over its back, tied underneath the thighs of the washer; this is a good plan, but as the latter cannot move while the handkerchief is tied, he must see that he has absolutely everything within reach. Some preferred an assistant to hold the bird, but Mr. Roué invented what he called a cock-saddle. It was a piece of board about two feet long and five inches wide, cut out or narrowed from both sides at one place for the bird's thighs to hang down. At one end of this narrowed place a padded cushion was arranged for the stern to rest against; and at the other end of it were two longitudinal cushions side by side with a channel between, in which the breast-bone rested: thus the bird was on its breast between the two cushions in front, its stern against the cushion behind, and the thighs and legs hanging down in the places narrowed or cut in for them. In this position it was secured by two straps buckled over the back, and braced together at a proper interval. The whole arrangement he used to insert into the drawer of a kitchen dresser, opened about three inches, more or less, by which it was easily adjusted at any slant required. He found the birds perfectly quiet on this saddle, and they soon received their daily treatment with the most absolute indifference.

In cold weather Spanish require efficient protection as regards the baskets in which they travel. The exhibitors whom we knew most of, used to line their baskets with flannel, which was well shrunk before being used. This gave ample ventilation, while it gives what the usual linings do not—good protection from cold and draught. As in all large-combed breeds, the baskets for cocks should be rather high. Some care should be taken in severe weather to select trains that are likely not to be too long on the road, for this breed undoubtedly suffers more than most from severe cold. It feels keenly also at the moulting season. At this time the combs shrink and shrivel to a great degree, so that even a good hen may appear to have an upright or "prick" comb; but on getting into condition again the former size is restored. Iron tonic is particularly beneficial at this time, also a little old ale.

Variations in Spanish.

As in the case of all black fowls, there is some little variation at times in the plumage of Spanish. Age will often bring many feathers tipped with white, sometimes all so, which gives a very curious appearance; and now and then actually white birds have sported, as in other varieties. One or two fanciers have bred these together, and produced a White Spanish; but the effect of white face upon white plumage has always been felt unpleasing, and in no case has the stock been kept up permanently, though we knew one yard in which it was bred for several years. Red or reddish-gold feathers are also liable to occur in the cock's hackles, the birds so disfigured being, as the late Mr. H. Lane pointed out to us, usually the richest and most glossy in colour of all in the yard. The fact is worth mention, because Mr. Darwin has made in regard to it a curious mistake through over much dependence upon what was told him, to the effect that "all who know anything of the breeding of poultry will admit that tens of thousands of pure Spanish . . . have been reared without the appearance of a red feather."* Of course, in one sense tens of thousands have been so, being selected free from them; but in the whole of tens of thousands bred, many red feathers would be seen. Such should be rejected in breeding, unless for some extraordinary quality in face; and by this selection coloured feathers ought to be reduced to a mere percentage.

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* *Variation of Animals and Plants under Domestication.*

Qualities of Spanish.

It is difficult at present to appraise the economic value of Spanish. The breed was never very good for table: the flesh and skin are white, as in most black fowls, but the former generally rather short and dry in character, and there is seldom much upon the breastbone, which usually projects, with little meat upon it. Its ancient fame was as a layer of very large white eggs, many of which were laid in winter, by young birds, when the breed was kept fairly hardy. We had some old returns of 150 to as much as 170 eggs in a year; and even so lately as 1870 the Bristol breeders, or most of them, reckoned on an average of 120 per annum, which was pretty fair for days when feeding for eggs was not understood as it is to-day. We fear no exhibition stock would reach such an average now, and whether the economic value of the breed can be recovered it is difficult to say. The one great necessity, above all, is an *increase of breeders*, to provide a variety of blood reared upon different soils: next to that a certain amount of return to more hardy methods of treatment. With more care and some common-sense in these respects, and more breeders, we believe much might yet be done; the field is very open, in face of the small competition, for any disposed to enter it; and it is much to be desired that a fowl which, take it all in all, is certainly one of the most stately and handsome amongst all the breeds, should be rescued from its present position. Among the poultry breeders in Australia, as we write (1911), there is evidence of a marked revival of interest in the breed.

In judging Spanish, the face is of course the chief point. Its size, its quality, its shape, its freedom or otherwise from folds and doubling, all have to be considered. A broad face and lobe rather short, if not too short, is better than a long one too narrow. Comb is also important, and these head-points make most of the bird. But handsome carriage and proportion should also be considered; here especially many present specimens fall short, being too tall and weedy owing to their poverty of blood. The following is the Standard of Perfection as adopted by the Poultry Club:—

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Long, broad, and deep. *Beak :* Long and stout. *Eyes :* Full and open. *Comb :* Single, somewhat small, erect and straight, firmly fixed at the base, rather thin at the edge, fitting closely on the neck at the back, of very smooth texture, and deeply and evenly serrated. *Face :* Long and deep, as large as possible, of very smooth texture, and free from wrinkles, rising well over the eyes but not so as to interfere with the sight, and joining the ear-lobes and wattles. *Ear-lobes :* Deep and broad, well rounded at the bottom, extending well below the wattles and meeting in front and going well back on each side of the neck, of fine texture and free from folds or creases. *Wattles :* Very long, thin, and pendulous.

Neck.—Long and fine, with abundant hackle flowing well on to the shoulders.

Body.—Rather long, fairly broad in front, and tapering to the rear. *Breast :* Full at the neck and gradually decreasing towards the thighs. *Back :* Slanting downwards to the tail. *Wings :* Short, and carried closely to the body.

Tail.—Full, not carried too high, and with the sickles large and well curved.

Legs and Feet.—*Legs :* Rather long and slim. *Toes :* Four on each foot, slender, and straight.

Carriage.—Upright, with proud action.

Weight.—7 lb.

Plumage.—Short and close.

HEN

Except that the *Comb* falls gracefully over to either side of the face, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—6 lb.

COLOUR

Beak : Dark horn. *Eyes :* Black. *Comb and Wattles :* Bright red. *Face and Ear-lobes :* White. *Legs and Feet :* Pale slate.

Plumage.—Black, with a beetle-green sheen, and free of purple bars.

SCALE OF POINTS

Face and lobes	35
Comb and Wattles	15
Type	15
Size	15
Plumage	10
Condition	10
	100

Serious defects : Blue, pink, or red in face or lobes; coarse "cauliflower" face or lobes; cock's comb not erect; side sprigs on comb; lobes pointed at the bottom; wry or squirrel tail; black or dark coloured legs and feet.

CHAPTER XXVI.

MINORCAS.

THIS breed in all probability came to England from the island whose name it bears, and more than one importation appears to have taken place. The late Mr. Leworthy of Barnstaple, who had bred it since about 1830, told us that several lots had come from Minorca, and that a friend and townsman of his, a Mr. Willis, had been familiar with similar birds in the island itself. The Rev. Thomas Cox, of Castle Cary, was personally informed by Sir Thomas Acland that his father, the previous baronet, brought birds from Minorca direct in 1834 or 1835, from which a strain had been bred at Holnicote for many years, and distributed through the neighbourhood; and the Acland family believed that the introduction of the fowl into the West of England was mainly due to this importation. Many strains probably did descend from the Holnicote blood; but there is strong general evidence that even before that Minorcas had been known in the West of England, and at the middle of the nineteenth century there were obvious *differences* between certain strains which bear out the supposition of several distinct importations. Mr. Leworthy, for instance, gave as his average weights 5½ lbs. and 4½ lbs., whilst other strains were considerably heavier even at that time.

This fine race had been known and valued in the West of England, from Cornwall up to as high as Bristol, for very many years before it attracted any attention amongst breeders generally. For its localisation there, the only reason that can be given is a somewhat special intercourse with Spain which has also left other traces here and there, and of which some slight indication is given in Kingsley's *Westward Ho!* The first brood of chicks we ever hatched, about 1850, were from Minorca eggs; and knowing the fowls thus from childhood, and their qualities, it was always a mystery to us that they should be so long confined to one corner of Great Britain. It is perhaps noteworthy that many of the people who kept them at that early date, called them "Black Spanish," and that throughout the West, when the "Black Spanish" was spoken of, it was generally the Minorca that was really meant. Many of the finest we ever saw were in the possession of poor men, who kept them for their eggs, which they sold new-laid; and though they never exhibited, were proud of their fowls, and in some cases refused a guinea for a favourite bird. In spite of this solid merit, and its striking appearance, however, the breed was very slow to make way out of its own corner. Our persistent advocacy of its merits had little effect for some years; but all of a sudden it began to "move," and since then its progress has been rapid. In 1883, soon after the movement had begun, there were at the Crystal Palace show only two classes and thirty-two entries; but in 1888 the newly formed Minorca Club held its first show at that great gathering, when there were six classes and 140 entries; and in 1911 the six classes contained 144 entries. There are few shows now which do not give Minorca classes.

Characteristics of Minorcas.

Broadly speaking, the Minorca may be said to resemble the Spanish fowl without its white face, and with a much smaller white ear-lobe; but there are perceptible other differences in detail, the body being more massive and compact, the legs shorter, and the comb of different texture. The head of the cock should be large and broad, without which the comb cannot be carried firmly; beak dark horn-colour; eye full and dark; comb single, upright, and straight; large, but not extending beyond front of the beak, and falling well back behind, but not touching the hackle; it should have a few bold serrations arranged in a nice arch, and is preferred rather rough in texture; it must be a rich bright red. The wattles are long and full, free from folds, also rich red, as must be the face, the latter having as few coarse hairs as possible, and perfectly free from white. The ear-lobe should be smooth and flat, almond in shape, and of colour and texture like fine white kid. The neck is rather long and curved, with full hackle; body compact and somewhat square, broad at shoulders, with full rounded breast, and the back broad and rather long; tail full, and carried well back, not upright. The legs and shanks are medium in length, the latter a very dark slate colour. The plumage is glossy black all over, but especially in the hackles, where gloss should be very great. In the hen the ear-lobe, though still oblong in shape, is rather more rounded than in the cock; and the comb arches over on one side of the face, but should do so in a manner not to obstruct the sight, and not be so large as to do this. The tail should be carried well back. The carriage is sprightly and graceful in both sexes: the average weights about 7 lbs. and 6 lbs. for adults, and 6 lbs. and 5 lbs. for cockerels and pullets.

The following notes were contributed by the late Mr. J. Harwood, of Tiverton, for many years Secretary of the Minorca Club:—

History of Minorcas.

"All past writers agree that this handsome and useful fowl was early located in the West of England, but how it came there can only be surmised. Ports such as Bristol, Barnstaple, and Plymouth had them before inland towns. The writer has reliable evidence from men living before the nineteenth century, that the Minorca was plentiful in Tiverton at that time. During the Spanish and French wars, prisoners were interned at this town for years; when peace was proclaimed some settled there, and it is probable they had these fowls over from the island of Minorca. In 1870 I was at a Plymouth show, and had a chat with a sailor who came from this island. He told me they had them of three colours—white, black, and blue; that they were not so large as ours, also not so good in head points, some of the cocks having cleft combs hanging each side of the head. We know how Messrs. Beard and Leworthy in the 'thirties, Sir T. Acland and Mr. Blackwell in the 'forties, Messrs. Williams, Roscorla, Physick, and Harwood in the 'seventies, and Messrs. Pitts and Stafford later, have done their best to show the world their grand all-round qualities, and it is fitting that records should be kept of how breeds maintain their usefulness.

"About the year 1870 I wanted eggs for my business, and made inquiries what fowl was the best layer. Having some old fanciers living here, all assured me none could come near 'them Spanierds,' a localism. One day my old mentor brought me a real live prize cock. Now, I knew Old English Game won cash by their pluck and spurs, but did not know then anything about shows. This caused the hen fever, which has stuck to me ever since. The Minorca I first knew was a thick-set, heavy fowl, very high and full in tail, with small white lobe, no signs, or even thoughts, of white in face, but a hard red, also very heavy comb, this being considered the proof of the best layer — no signs of any broodiness. Having sent a cock to a show, I made some outside friends, one of whom, Mr. R. E. Roscorla, sent me a lot of correspondence on the points which the Red-faced Minorca should be judged by. We drew up a scale of points, which later on was taken up very largely as the Standard of the Minorca Club.

"It is simply astonishing how this fowl has since practically gone over the whole world. The North of England took them up well, and we have some breeders there who beat the south in hens and pullets. This I attribute to their colder climate, as our birds here start laying before coming to any size, and this stops their growth. Scotland, America, New Zealand, South Africa, all say the same—that they are hardy, handsome, and maintain their utility. This I again attribute to the earnest manner in which the large majority of our fanciers deal with the Minorca as an exhibition bird. They are determined not to sacrifice its laying powers for any fancy point. The fancier has made the Minorca the most popular fowl in existence, improved its shape and size, reduced the immense comb, put a deal more flesh on its body, till it is now far away the best table-bird of the non-sitters. But on one point the fancier has made a serious error; he has created a large white lobe, which has caused the grand characteristic red face of the breed to become more or less white too; and what is still worse is that a decline all round seems to set in with the white face: whitish flights, light-coloured legs, very green plumage, and a decidedly more delicate bird —in fact, all on the downward road to a mongrel Spanish. This is the rock the Minorca fancy has somewhat split upon. Some four years ago we seemed to have reached high-water mark in perfection, but have now receded, being able to get but very few decent two-year-old cocks. It is to be hoped that the firm stand made by the Minorca Club in demanding a perfect red face, coupled with the offer of more prizes for old birds, will cause an improvement in the direction of having Minorcas to improve up to their third year, as they used to do.

"Minorcas are grand layers of extra large white eggs, small eaters, are of an active, industrious, contented disposition, and will thrive in a back yard; hence their popularity. The chickens if not 'coddled' come away quickly, are fully feathered in a month, and pullets often lay at four and a half months old. Many fanciers write against large combs; this is due to the place in which they are kept. In cold, exposed places the comb development is retarded; in secluded, sheltered runs the combs are certain to be large, especially if of a good laying strain.

"Many firmly believe some cross has been of late imported into the Minorca; I have done my best to find out, and do not believe it. I know La Flèche was *tried*, but it was a rank failure. Black Cochin was used by Mr. Roscorla forty years ago. I had some of his hens, and among them tinted eggs often cropped up. Black Game were bred here sixty years ago and the Minorca used, and the gipsy face and red iris in eye is still in some of our present day Minorcas. This shows that if Langshans had been used, as some think, we should see signs of this vigorous blood in the Minorca. No breed shows less of crossing; they are too plentiful to require any cross. The broodiness that is prevalent is caused, in my opinion, by over-showing the parents; we get a less vigorous progeny, and Nature steps in with a rest. This is Nature's way of recuperation.

Breeding Minorcas.

"The aim of most fanciers is to make their birds pay. If you go in simply for eggs, all you have to do is to select a pen of birds, and yearly note and keep the best layers; hatch your chickens from March to May; then if your place is suitable for the Minorca, you can depend upon having eggs all the year round. It is a real fact that a selected Minorca hen, with good food, warm shelter, care and cleanliness, is practically an egg-making machine. If your ambition is the Club's challenge cups, it will tax all your skill, means, and pluck to breed for them. Here the best layer has often to stand out. I prefer a cockerel of the previous season, mated to five two or three year old hens. You can depend upon this pen for fertile eggs, and the chickens grow away at the start stronger than from pullets. There is no doubt the progeny from an old cock will last longer the strain of exhibiting, so those who have room should mate up both cocks and cockerels, and you should at least have age on one side of the sexes.

"The male bird influences the style, shape, colour, structure of the comb, and the fancy points; the hen the size, colour of leg, and especially the serration of the comb. The lobe of the hen should be clear, and quite distinctly away from the face, or you will get creased or folded lobes in the cockerels. I do not hold with separate pens for breeding cockerels and pullets; it is all right so long as the breeder knows his birds, but let another have them, and his strain may be spoilt as regards the combs on the cockerels. On the male side, after face, the most important item is comb, especially its build and formation. I do not mind an uneven serration so long as the comb is firm on the head, simply growing out of the skull, not fleshy or flabby. Comb guards I detest, and they are not required if the comb is as it should be. I like five good wedge-shaped spikes, which should be the same length as depth of blade. The head should be fairly long, with a strong beak; the face perfectly red, back under the lobe to where the lobe adheres; the lobe fixed on quite distinct and clear from the face, coming partly over the face, fitting closely both sides. The legs, beak, and toe-nails very dark horn colour; our old breeders demanded a dark horn toe-nail as showing the real Minorca. The plumage a dense black, showing in the sunlight a white gloss as on a rich silk dress. Of late, the green-lustred plumage is much too prevalent. The hackle feather is very fine and thick, the quill feather to the stem is black as ebony, and very tough, very different from the coarser, crisper feather of the Spanish.

"The hen to breed cockerels should be higher on leg; a good, long, intelligent head, with a neat, evenly serrated comb, which should adhere closely right up on the point of the beak. Many hens' combs do not adhere to the point of the beak by an inch, and you get coarse, twisted-combed cockerels from them; also the comb does not grow direct from the skull, but hangs by a thin substance and falls dead over. I prefer the comb to rise firmly from the skull at its base, fall a little over one side, then fold over gracefully the other side. The lobes on both sexes must be good in texture, and the correct 'almond' shape. For pullet-breeding you may have hens coarser in head points, and it is not so particular as to the comb adhering to the beak at front, but what defect you have on one side must be counteracted on the other. The birds to avoid in the breeding pen are those showing the least sign of white in face or eyelid, white in flights, high or fan-tailed. A red feather in hackle denotes strong, healthy vigour, and generally rich plumage.

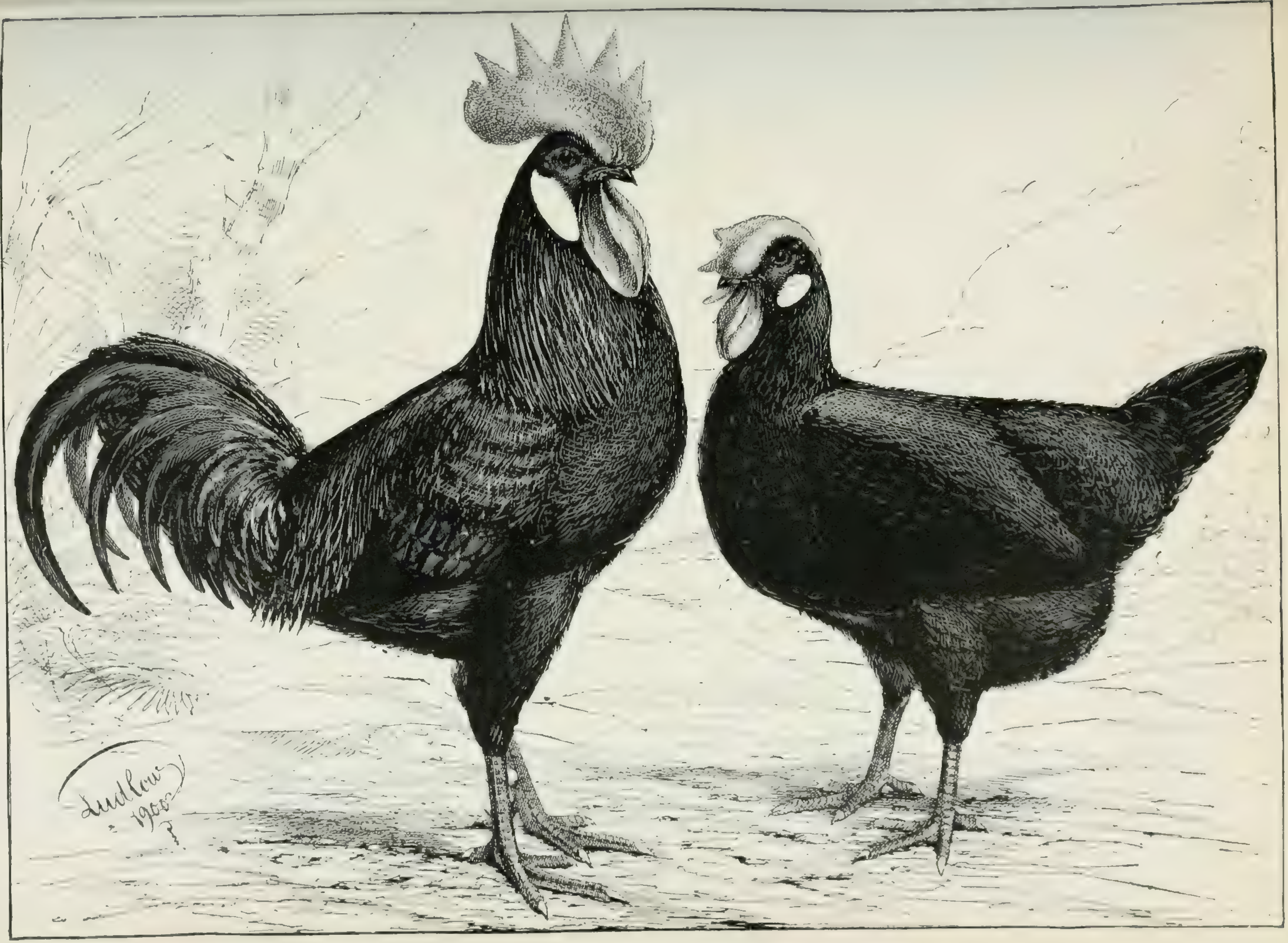
"The best time to hatch is February for cockerels, but pullets hatched then generally come on to lay a few eggs, then moult like hens. March and April are the months, the chickens then seem to grow right away. I much prefer the foster mother, but no coddling; take care they do not crowd, but lay about by themselves; more chickens are killed by being kept too warm than too cold. A sure sign you have healthy chickens is when you cannot hear them peep. Give them plenty of amusement; those who have a manure heap can make the chickens as happy as the day in digging and scratching. I boil all water given to chickens, but much prefer skim milk, kept sweet and clean, and as much as they will drink; also daily raw rice, they then can make their own custard; in all else as others advise, only see a change is constant, no food lying about. As soon as they are the size of blackbirds I commence to toast what I do not mean to keep; cockerels that have false spikes, high tails, later on too forward in comb. Those that are coming on too fast are only good to eat; those that are slim, backward and awkward, so long as combs are nicely serrated, are the ones to keep. It is better to have a dozen good promising cockerels, than forty duffers who take up each others' room. The pullets you cannot decide on much until they lay, but they do not require the space, nor are they anything like the trouble cockerels are to become A1. In many breeds maize is condemned as food; I never knew maize yet to injure Minorcas, in fact I know it is very largely used by breeders; I feed quite one half on it. The only time is in the hottest part of the summer or the latter part, when they start moulting; then I stop giving them this cheap food. Good laying Minorcas will not put on too much fat: they are too industrious.

Exhibiting Minorcas.

"Minorca cockerels want all the run and exercise you can give them. They can be kept together until their sickle feathers begin to bend. Then the best should be put in separate runs, as they are great tyrants, and damage each other's plumage. They must be well watched, as some will fret themselves, and once a cockerel goes back he very probably is spoilt. Give him an old hen or pullet a few days; this gives him pluck, and makes a man, as it were, of him. When about to show him, train well by taking him off his perch of an evening and placing him in a show pen, and using the judging stick around him. Repeat this a few days, and you will get him to stand up well and show himself to the best advantage. Also place him in a hamper a few times for an hour or so. Many a prize has been lost and tails broken for want of a little training before sending to a show. The best thing to clean combs and wattles is soap, a stiff nail brush, and ice-cold water. If this will not make them red and healthy, keep them home. Pullets can be shut up more closely, and shifted from run to run to stay maturity. When they shoot their combs, it is wise to place them in a well shaded, covered run; this brings out the colour of the plumage, lobes, and bloom on the comb. The great secret of success in the show pen is condition. It is not the slightest use in severe competition to send Minorcas unless they are at their very best. Pullets look charming a few days before laying. Cockerels often get so excited at shows that they never regain their appearance lost whilst in the show pen. A great deal of adverse criticism is from not realising that the bird may have quite altered from one show to another.

"A great deal has of late been written on lobes, but the Minorca Club's standard has been adopted by the Poultry Club and by others. The lobe in shape is as the Valencia almond. The Standard states: 'Almond shaped, fairly large.' This does not mean either too large or too small. It is impossible to lay down the size in every bird, but it should be a lobe that helps make the bird well balanced in head points. From measurements sent me by several noted breeders I take a lobe of a full-grown cockerel to be at the outside in depth 2¼ inches; in width at the widest part, just below the top, 1⅛ inches; at the base, ⅜ of an inch. The pullet: 1¼ inches in depth, 1 inch at its widest part, tapering to correspond with the cockerel. This on paper looks large, yet on the bird is not so; this very size has been reported on by judges as 'could do with more lobe,' and in the pullet as 'fair lobe.' The main point at issue is really *shape*. Several well known winners have round Hamburgh lobes. Others, again, are wider at the bottom than at the top; either of these looks immense and out of place.

"Exhibitors and judges should understand that the commercial value of a bird is about 3s. To be worth £5 to £30 they should bear criticism from beak to tail. Exhibitors that are real fanciers expect judges to handle well, to see that the face is really red and likely to remain so, that the comb is upright, free from false spikes or thumb marks. In hens or pullets, especially note if combs are evenly serrated, plumage is genuine to wing ends, and if good body and carriage. The shape and condition of the lobe is an important point, but a tinge of red should not overthrow an otherwise good bird. Some ridicule has been cast on the point of white in face being a 'fatal defect,' and yet prizes having been awarded to birds showing this defect. No judge can always decide by the standard, as in many classes none approach the standard; but all should be guided by it. A bird showing this hated defect has a defect that is fatal to any rank as a standard Minorca. This to me is the common-sense meaning, and was so meant when the scale of points was drawn up. While this defect is really taken at its real value, I have no fear of the red-faced Minorca ever disgracing the old fanciers who so manfully stood by it."


Ludlow 1900

BLACK MINORCAS

In reference to one point mentioned in the above notes—the question of a Langshan cross having been used upon the Minorca—we have been obliged to come to a different conclusion from Mr. Harwood, except that the cross was probably employed at an earlier date than he has had in view. Having noticed and reported manifest signs of it on previous occasions, in 1892 we went with a friend carefully through the large Minorca classes at the Palace, and both agreed that there was undeniable evidence of Langshan blood in rather more than half the pens. It was to be seen in stature, in size of shank, in the scaling of the shank, and in many cases there was visible even the peculiar Langshan *crimson* colour between the scales; it was also visible in some cases in the character of head and comb. The cross was, in fact, admitted to us by one or two individuals; others no doubt were ignorant of it, and had only imported it through supposed pure-bred stock; in one case the cross had been made through the Black Orpington. There is no doubt that the new blood has done good on the whole, improving size, and flesh, and constitution, while most of the signs we noticed in 1892 have since been bred out again: but at that date the facts were obvious, and there is little doubt that the cross was found advisable owing to evil done previously by injudicious breeding for exaggerated points.

The Langshan Cross.

The first tendency was to breed for exaggerated combs and wattles. The late Mr. Hewitt once challenged our admiration of a pen as the "best he had ever seen," because of the immense size of the comb and wattles, the latter measuring 6¼ ins. long. As indicated earlier in this book, such enormous appendages are a severe tax upon both muscular and nervous energy, causing sterility or weak germs, and making birds unable to stand severe weather, or to lay in winter unless in warm shelter. That large appendages are connected with laying power to some extent, no one doubts; but that so *much* development is ruinous in its results, has now been proved by a mass of evidence which has compelled fanciers to dub such birds before breeding them, and it is to be hoped that excess in this particular direction has now received some check. The Standard of the Minorca Club and Poultry Club now describes the comb as "fairly large"; that of the London Minorca Club as "rather large," and that of the Northern Minorca Club, now known as the British Minorca Club, "size consistent with size of bird." In the case of letters in the poultry press complaining of the failure of the Minorca as a winter layer on farms, we have traced the cause to this matter of exaggerated comb, and it is to be desired that the present standards should be adhered to in this respect. It should be remembered that the large combs many of the old breed undoubtedly possessed, before bred for exhibition at all, were due naturally to the moist and mild climate and rich pastures of Devon, where they were far less injurious; but that when such combs were bred for, in drier and colder regions, they became another matter entirely.

Exaggeration of Points.

The other chief fancy point about this breed is the white ear-lobe, concerning which there has been something like a cleavage of opinion between the breeders in the north and south of England. At a very early period after the fowl began to be exhibited, a tendency was shown to enlarge and broaden the ear-lobe, and among judges to lay too much stress upon its size and smoothness, to obtain which Spanish crosses were avowedly employed in some cases, the crossed blood rapidly spreading by means of sales. The useful qualities of the breed were greatly injured for a time by this course; for either the cross, or the increase of lobe in itself (even that would be quite sufficient to account for it) brought into the birds exhibited signs of *white face* upon every side; we are writing of what we actually observed at that time, as a new feature, from which the Minorca had been quite free years before. In itself this white face would have done no particular harm; but although the white under the eye was tolerated for a time, it soon had to be checked; and then the necessity for choosing birds *with* the large white lobes, and yet *without* the frequent white face, narrowed selection so closely, and involved so much in-breeding, that once more followed a decline in constitution and the number of eggs, especially in winter.

Size of Ear-lobes.

As just indicated above, regarding this point there was undoubtedly some difference of opinion between northern and southern breeders of the Minorca; so much so that the body originally known as the Northern Minorca Club was mainly formed to embody views more favouring a comparatively large lobe. There was a great deal of discussion in 1900 and the early part of 1901 about the ear-lobe, especially in connection with a bird that had taken high honours, and been objected to by many West of England breeders as having far too large and broad a lobe; in fact, an almost circular one. But when this was over, and the disputants got down to figures and description, the differences appeared much less than had been supposed. It appeared on the one hand, that Devonshire breeders had not objected to the length of the lobe on the bird which occasioned the debate, but to its great width, which made it almost circular; and the standards of the Minorca and Poultry Club and London Minorca Club alike describe the lobe as fairly large and almond shaped. On the other hand, the new standard of the British (formerly Northern) Minorca Club now also describes the lobes as "almond shaped, hollowness and roundness to be disfavoured, the size to harmonise with the rest of the body." When it is added that in number of points for lobe all the standards agree, it will be seen that substantial agreement has really been arrived at, and only needs to be maintained. The chief real difference is that the British Club only "severely penalises" white in face, whilst the other clubs place this fault amongst the fatal defects.

Other Differences in Ideas.

In two other points there is some difference between ideas in the north and south of England. In the north they like a perceptibly bigger bird, the special northern standard going up as high as 10 lbs. in cocks and 9 lbs. in hens. They also like them appreciably higher on the leg. the "British" standard formerly defining the shanks as long, while the other standards called them "medium length," and we know from personal friends that northern fanciers consider short-legged such birds as are preferred by the Devonshire breeders. The third point is colour of the plumage, which by the northern standard is described as "greenish glossy black," whereas the others called it simply "glossy black," and southern breeders, as a rule, objected to the green. Of course, no law can be laid down here, in any matter, as to preference to-day; but historically—we are writing about a fowl which we have known from childhood, noting every development in it during fifty years—there is absolutely no doubt as to the original Minorca type. Mr Leworthy's description, published in 1872, is alone sufficient to prove that the original Devon Minorca was not over large, was rather low on the leg and massive in body, and of a "crow" black, not a green black. The fowl being a Western fowl, in fact, is itself proof that Western ideas represent the original type; and there is no doubt that both the height on leg and green lustre now permitted, are mainly due to the Langshan cross above alluded to. It may not be entirely so, because about Bristol especially many birds were to be seen with more length of limb, green lustre, and white in face: these were clearly due to crossing with the Spanish, for which that city was then famous, and some of this blood may still survive. That the original Minorca of Devon was a low-bodied, crow-black bird, with moderate-sized ear-lobes, is absolutely beyond dispute. But with the simple statement of this fact we must leave the question. That the plumage should be free from any bars of colour, *e.g.* purple bars across green feathers, as we have seen in many pens, all breeders and judges would agree.

There is very little to add to Mr. Harwood's notes upon breeding and rearing. In regard to breeding stock, the cock or cockerel may be small, if good in points and fairly long in keel proportionately; but the hens or pullets must be of good size, and particularly have the desired length of body. If the male has a very large comb, and appears at all distressed, or even dull in consequence, he should be dubbed before breeding, or else the eggs will be either clear or weak in the germ. A large number of Minorca males are now dubbed for breeding by the more experienced breeders, and it is heartily to be wished that this might become unnecessary by adopting a more moderate development of comb, as in the United States. In regard to age, in itself there is nothing especial to say; but it is worth mentioning that the dreaded fault of white face is most apt to appear in the second season, and therefore adults free from this blemish are specially valuable as safe breeding stock.

Rearing and Care of Chickens.

Should the chickens be reared under a hen, the cockerels ought, if possible, to be got away from her at four weeks old, else the pressure and heat upon their combs is but too likely to ruin them. No breed requires so much of the care and vigilance described in Chapter XII. regarding the combs of the cockerels as this, owing to their size and early growth. Cockerels are safest in rearers not of the "coverlet" type, with no more heat than really necessary. As they get older, the two sexes come to their best under different treatment. Up to about a month both may have good feeding, with animal food as usual. After that, however, the cockerels do best (if for exhibition) with plain food of adequate nutritive ratio, as wide range as possible, and roosting in a house with the door open up to say five months or so, after which the ear-lobes may want more shelter. But up to that time the object is to make frame and size, while retarding development of comb and head-points, and keeping the comb straight and firm. In close houses and covered sheds these are apt to grow too rapidly, and to become soft and flabby; it is chiefly birds so reared that require the comb-guards described in a former chapter. Pullets, on the other hand, grow better combs, and falling more nicely over, if kept more under cover and in warmer quarters, but they also do perfectly well on a good range.

At about five months old it is time to look after the lobes; and during all cold winds the birds should be confined in runs sheltered for at least 30 inches from the ground. This will often entail confinement in a shed or enclosed run; and when this is the case the shanks should be rubbed twice a week or so with a rag and a mixture of oil and paraffin, rubbing it well off again. For some time before exhibition the birds should be kept out of bright light, as well as cold wind, to bleach the lobes; but it is not advisable to shut them up like Spanish in warm houses, or even in darkness for more than a few days. The reason is that the larger combs will not stand heat; and vivid red in the comb, wattles, and face is as important as white in the lobe, and suffers from much darkness. But the lobe should, if necessary, be washed, dried, and attended to as in the case of the preceding breed. A pullet's comb can be easily worked over a little if necessary, working it gently every day between finger and thumb.

There is no breed in which a vivid red is so important about comb and face. To attain this the birds must be in perfect health when put up, and during the period of training they should have a little shredded raw meat every day, adequate green food, and a little of the citrate of iron and potash in their water, not forgetting grit in the pen. Some breeders believe that a supply of chopped garden onions (not Spanish) every day, with a special feed of it the last thing, tends to brighten both the colour and the eyes. It can, at all events, do no possible harm, if not pushed to the extent of purging.

Economic Qualities.

The Minorca must be classed amongst our most valuable poultry. The flesh is not of the first class, not being very tender or juicy, but is far better than that of the Spanish, fairly plentiful on the breast when well fed, and white. It is as a layer, however, that the breed is so useful, laying not only many in number, but the largest egg of any breeds known, very many eggs weighing three ounces each. It is not a distinctively winter layer, but April pullets may generally be depended upon, and the yearly average, when well bred, is high. Some years ago we had the curiosity to get returns from a few of the older breeders, and Mr. Hopkins, counting four pens, made it 226 per annum; Mr. Physick (seven pens) 186 per annum; Mr. Amesbury 180 per annum, and a few of his birds 200. These were of the older Western type, and there is no doubt that some of the modern birds have fallen much below such figures, and proved disappointing as a farmer's fowl. But even these have rarely failed to lay well in winter if kept in sheltered runs; while judicious selection will give good results on free range, in all but the more severe winter climates. For confined suburban runs the Minorca is one of the very best fowls that can be selected, being quiet and contented, and having the curious property of cackling much less before or after laying than any breed we know.

The Minorca is also valuable as a cross. With almost any breed, even the Cochin, and much more with others, it produces a good layer and hardy fowl; and a cock or two turned down on any farm with even ordinary scrub fowls, will in two seasons produce a race that lays large numbers of eggs. Crossed with the Langshan, the produce is one of the hardiest and most prolific fowls known, which has been tried all over England and never found wanting.

Rosecomb Minorcas.

Within recent years the Rosecomb variety of the Black Minorca, although not recognised by the Poultry Club, has attracted many admirers, more especially among utility poultry keepers, since it is recognised that it possesses many useful properties. Its first appearance in the show pen in this country was in 1906, when Mr. R. W. Webster, of Maidenhead, who "manufactured" the British type, staged three specimens at the Crystal Palace; but for some years previously the variety had been bred and exhibited in the United States. The Rosecomb Minorca, which should be an ordinary Black Minorca in every respect but comb, met with much opposition on its introduction to the poultry-keeping public, but the formation, in 1910, of a club specially to foster its interests has done much to give it something of a vogue in Great Britain. It may be added that the type of Rosecomb required in exhibition specimens is one that is full in front, with the leader following the curve of the neck, while at the same time the whole fits neatly and closely to the head.

Minorca chickens have often a number of white feathers, and as a rule those with the most turn out the best colour ultimately. But occasionally there have been all-white sports; and from such, bred together, a White variety of Minorcas has been produced. These should be exactly the same as the Black in all but colour of the plumage, which is desired as glossy a white as possible; of course, more glossy in the cock than the hen.

White Minorcas.

The White Minorca is really a good-looking fowl, the brilliant red face giving more contrast than the white face of the Spanish, which looks ghastly and unpleasant upon a white bird.

It is rather curious that the earlier White Minorcas known were described as more delicate than the black parent variety; that character was given them by Mr. Leworthy, whose experience went back to 1834. On the other hand, some who breed the fowl now have reported upon them as perceptibly hardier in cold situations, while fully equal, if not superior, as layers, to neighbours of the Black persuasion. The reason may probably be delicacy in the Blacks from causes already adverted to; while the Whites, having less contrast of colour in the lobes, have been less rigorously selected for these, and having also usually rather smaller combs, have in constitution proved superior. Nothing need be added respecting the breeding of the white plumage to what has been said under other breeds.

Black Minorcas are bred in America with smaller combs and ear-lobes than in England, with somewhat less massive bodies; and in a much more severe climate than that of England, greater hardihood and more prolificacy (on the average) have resulted from such differences.

The following is the Poultry Club's Standard of Perfection:

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Long and broad, so as to provide a substantial foundation for the comb. *Beak :* Strong and of moderate length. *Eyes :* Full and bright. *Comb :* Single, fairly large (consistent with the size of the bird), upright and straight, free from any twist, thumb marks, or side sprigs, not extending over the beak, and reaching well to the back of the head and following the line of but not touching the neck-hackle, of moderately rough texture, and with five to seven wedge-shaped spikes. *Face :* Smooth, of fine texture, and as free as possible from feathers or hairs. *Ear-lobes :* Almond shape, fairly large (to harmonise with other points of the head), of kid-like texture, flat but of thick substance, and fitting closely to the head. *Wattles :* Broad and long, and well rounded at the ends.

Neck.—Long and covered with flowing hackle.

Body.—Long, broad shoulders, giving the back a somewhat flat appearance, gradually tapering and sloping to the tail. *Breast :* Full. *Wings :* Moderately long, fitting closely to the sides.

Tail.—Full, abundantly furnished with feather, with broad, long, and well-curved sickles, and carried nicely back.

Legs and Feet.—*Legs :* Strong and moderately long. *Toes :* Four on each foot, long, and well spread.

Carriage.—Upright and graceful.

Weight.—7 lb.

HEN

Except that the *Comb* droops over to one side of the face and is carried so as not to obstruct the sight, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—6 lb.

COLOUR

THE BLACK

Beak : Dark horn. *Eyes :* Dark. *Comb, Face, and Wattles :* Dark blood red. *Ear-lobes :* White. *Legs and Feet :* Black in cockerels and pullets, dark slate in cocks and hens.

Plumage.—Glossy green-black.

THE WHITE

Beak : White. *Eyes :* Red. *Comb, Face, and Wattles :* Blood red. *Ear-lobes :* White. *Legs and Feet :* Pink-white.

Plumage.—White.

SCALE OF POINTS

Head : face, 15 ; comb, 15 ; lobes, 10	40
Colour : plumage, 10 ; legs, eyes, and beak, 8 ..	18
Size	15
Condition	10
Shape	10
Breast-bone	7
	100

Serious defects : White in face; wry or squirrel tail; feathers on shanks or toes; other than single comb; plumage other than black or white in the several varieties; other than four toes; legs other than black or slate in Blacks or white in Whites.

CHAPTER XXVII.

ANDALUSIANS.

RESPECTING the modern or present-day fowl known by this name, nothing very certain or definite can be said; except that it must be regarded as being more or less distinct from the breed so known many years ago. Many of those earlier birds were traced to the late Mr. Coles, of Farnham, who in his turn purchased them from a Mr. Richardson, of Portsmouth, who got them from a Spanish trader in 1851. The late Mr. Leworthy and others received this blood from Mr. Coles, but Mr. Taylor, of Shepherd's Bush, also imported direct. These earlier birds are known to have been afterwards crossed with Spanish, chiefly in order to get rid, if possible, of a fault very common in them, of a small upright comb in the hens, much like a Game hen's comb. The colour of many was a sort of dove-colour, with hardly any lacing at all; but others were more blue, with fair black lacing. None of them were quite so reachy and Game-like in form as the Andalusians of the present day. Most, if not all, of this early blood is believed to have been lost or bred out, but Miss May Arnold imported further specimens, and both these and what was left of the older strain were no doubt crossed with the Minorca, partly to enlarge the combs, and partly to deepen the lacing and top colour. The existing stock comes of this undefinable mixture of blood. To the Minorca cross has often been attributed the constant appearance of black and even white chickens, but this is an error: the colour itself, as stated before in several places, is essentially a mingling of white and black blood, and would sport black and white with no further cross at all: the two foundation colours will always contend for the mastery in any breed of this kind. What we think is to be regretted, is the loss of the old Andalusian comb, which was very characteristic, even when not too small; being lower, but long behind, and with a more numerous serration that was very typical. The comb now is of more Minorca style, not perhaps quite so high in proportion as that breed, and not coming down so low over the neck behind, but of similar stamp: Mr. Ludlow has depicted one of the best types in the plate, which can be compared with the Minorca, showing some difference, but not a great deal as formerly.

Rather remarkably, in spite of the crossing that has undoubtedly taken place, the present Andalusian still retains a great deal of individuality; no doubt partly due to selective breeding, but in part remaining from original distinct Andalusian blood. To breeding is probably due the fact that it is more Game-like and reachy in general build than any other of the great Mediterranean tribe; higher on the leg, more slender in body, and more alert in gait and habits. But to "blood" must be due its very strong vital characteristics, especially the extreme precocity of the chickens. We have seen and heard cockerels of the old stock crowing at seven weeks old; and though that would scarcely be equalled now, unusual precocity and sexual vigour do still remain. It is to be hoped it may not be lost by encouraging exaggerated combs; but we have known already of several birds having to be dubbed before breeding was satisfactory. The older stocks were also, when in confinement, rather specially prone to the vice of feather-eating, owing, we believe, to their restless energy; and several recent breeders have confessed to the same fault, but others have denied it. There are probably differences from strain and management in regard to this, but it will be seen that the race is one of marked individuality still, in spite of crossing and some amount of breeding to other types.

For the following article on the Andalusian as bred to-day, we are indebted to the late Mr. Robert Little, Rokeby Cottage, Glossop, who will be remembered as a very successful breeder and exhibitor in his own name, and equally so as manager for Mr. W. H. Bourne, of Chester, whose successes will be in the recollection of most fanciers.

"The modern Andalusian, one of the Spanish varieties of fowls, has made rapid strides towards perfection during the last ten years, the size, ground colour, and lacing being now almost perfection, and a great contrast to the light-coloured, slaty, or drab fowl without lacing it used to be. To-day I am also glad to say that the Minorca type is fast dying out, giving place to the upright, Gamey type which is the proper characteristic of the breed. It is one of the most beautiful and prolific fowls that we possess in this country, and at the time of writing this article is fast gaining ground, scores of new fanciers having recently gone in for the breed. This is not surprising, for the Andalusian suits alike lord and lady, to adorn the lawn; the exhibition pen, for the fancier; the farmyard, for the farmer (where its cackle never ceases); also the back-yard, for the townsman; in fact, with good attention it is scarcely possible to put it in the wrong place, for it is hardy and will thrive either in north, south, east, or west. I also believe that it has the honour to be the only fowl that represents the Union Jack of Old England, being red, white, and blue. So it can easily be styled a national fowl.

Characteristics of Andalusians.

"Andalusians are of the non-sitting variety; very seldom does the Andalusian hen want to sit. The cock should have a head large and deep skulled; beak rather long, stout, and of dark horn colour; comb red, of moderate size, evenly serrated, spikes wedge-shape and deeply cut; the back shot straight out from the head, not curved down or following the neck like Leghorns or Minorcas. This spoils the appearance and takes away the alertness of the bird. I do not, however, on the other hand, like to see a comb cocked up at the back of the head, or pointing upwards. The wattles should be long and thin, both comb and wattles to be of finer texture than either of the above-mentioned breeds. Eyes large, brownish orange or red, full of fire; ear-lobes almond-shaped, not too large, fitting close to head without folds, and of good substance; face red, free from white spots; neck long and arched; hackles very long and flowing, colour of hackle jet black, free from rusty or ticked feathers, which is a very great fault, especially when found in a bird wanted for stock purposes. Hackle, saddle and sickle feathers in cock all should match, the colour a rich velvety black; breast a nice medium slaty blue, clear right up to the throat if possible (which is very hard to get), each feather laced with black lacing, fine and sharply cut. The straight or primary tail feathers in cock should match his breast in ground colour. General shape and appearance active, broad at shoulders, narrowing towards the tail. In size the larger the better, legs and shanks long, giving the bird a reachy appearance. Colour of legs dark leaden hue, toes same colour to match, and should be long and thin. The tail should be carried sprightly but not too high; carriage upright or Gamey. The weight 7 lbs. to 8 lbs.

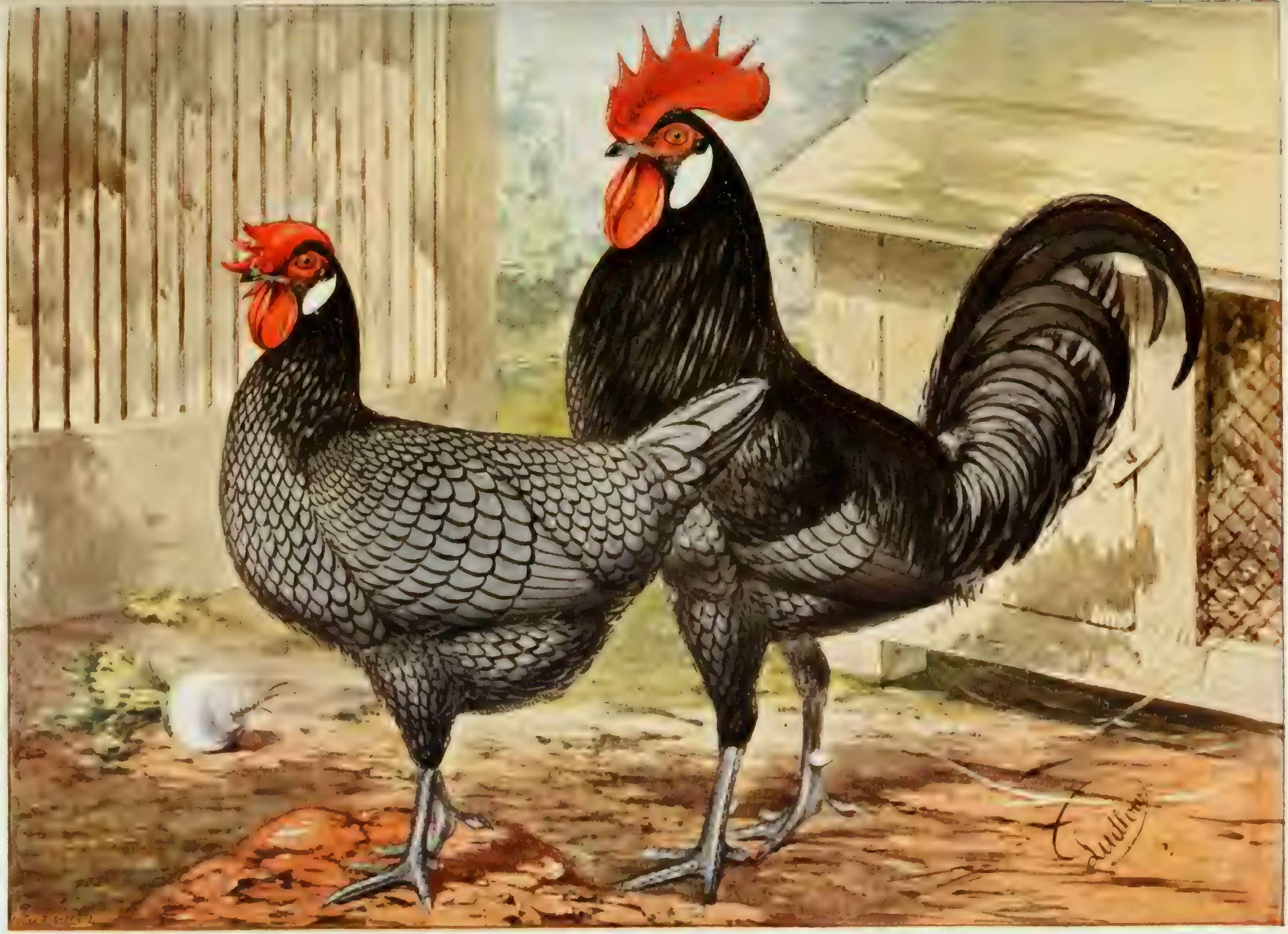
"In hens the ground colour varies considerably, there being the light, medium, and dark shades of blue. It is the happy medium fanciers want to breed to, with the ground colour as clear and distinct as it possibly can be got. All body feathers to be of the one shade, well laced, or with heavy black lacing sharply cut, not blurred or double-laced. The hackle should be jet black, free from brown or white feathers; tail the same shade of blue as the body. Type Gamey, very stylish, upright, when standing the breast carried well forward. Head large, with good fiery eye similar to cock; comb evenly serrated, not too large, but gracefully laid over to one side; large meaty combs to be avoided, as it entirely spoils the alert appearance of the fowl. Legs and feet very dark leaden colour, almost black in the pullets. Lobes almond-shape and of pure white, with plenty of substance, not too large; face red. Disqualifications: yellow, red, or white feathers anywhere; legs any other colour than blue.

Merits of Andalusians.

"In regard to the utility of Andalusians as egg producers, I have bred and kept this variety of fowls for a great many years, and find them excellent layers of large white eggs, six or seven of which will weigh a pound. The number of eggs each fowl will lay in a year will reach close on 200. The eggs are very rich, with a very delicate flavour. Taking quantity of eggs, size, and flavour, I question if the Blue Andalusian fowl can be equalled by any other breed. The pullets are very precocious, and often begin to lay at the early age of five months. I once had a pullet that laid at seventeen weeks of age, and once I won the cup at the Crystal Palace show with a cockerel twenty-seven weeks old, thus proving how fast they mature. During this last fifteen years I have kept most of the other breeds, but as egg producers none of them have come up to the Andalusian.

"As a table fowl they are of fair average size, cockerels from 7 lbs. to 8 lbs. and pullets up to 6 lbs. weight. Their flesh is white, very juicy, and of a delicate flavour; they dress up plump and look well on the table. With two such excellent qualities combined, the Andalusian can lay fair claim to be classed as one of the very best and most useful fowls amongst our domestic poultry.

"As a fancy or exhibition fowl they need very little preparing for show. When kept on good grass runs they can be taken off the same into the show pen, if tamed by handling previously. All the preparing necessary is the washing of comb, face, lobe, and legs. When shown from the run in this way they look a



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ANDALUSIANS.

picture of health; that is, if fully matured and in full plumage.

"Proper mating is a very important question: to be able to put two and two together to produce our ideal specimen. Perhaps my experience may be of some use to the readers of this book. There are two ways in which the Andalusian can be successfully mated. Select in the first place a tall, dark blue cockerel with jet black hackles, black saddle, and sickles very heavily laced, and put him with light blue, evenly shaded hens, two years old. The hens should, of course, have good head points, and be well laced. From such a pen, if the whole pen be the same strain (this is important), good exhibition birds may be expected.

Breeding Andalusians.

"A second way to mate up is to take a good, tall, light blue, two year old cock, well laced; then select five or six pullets twelve months old, of the very dark shade of blue, well and heavily laced, and good head points of course. From this second mating also, really good show birds will be produced, provided, as I said before, the strain is the same. Of course, the cock bird must not be too nearly related to the hens, but a distant relative. The greatest mistake young or amateur fanciers make is to use cocks or cockerels unrelated. The first cross is always disappointing in this or any other coloured breed. What I have written I practise. For example, I am just going in for White Leghorns. I purchased a two year old cock, one I liked much, so as to get the strain. I also purchased at a big figure his daughter, with three others, probably half cousins, and I shall breed from above pen just as mentioned, and confidently expect good results. Returning to our text on Andalusians, as a rule their eggs are very fertile, and the chicks hatch out strong. They are easy to rear and grow very fast; often the cocks are crowing at four months of age.

"There is one drawback to the breeding of Andalusians. The chickens come three colours: blue, black, and white. To-day we get upon an average from 70 to 75 per cent. of blues. The question is often asked, 'Can all blues be bred?' I answer this question by saying, Yes, but not to advantage, for we cannot very well spare either the black or the white chicks. We want the white in the breed to keep our ground colour clear; and the black for our grand black hackles and saddles. So I for one am perfectly content to allow them to remain. There is always a ready sale for them to the egg producer; and comparing them with other fowls, I am of opinion that out of 50 Andalusian eggs set, as many show specimens can be bred as from most other coloured breeds."

Question of Off-colours.

Very little indeed can be added to these notes. It should be remarked that the almond-shaped ear-lobes are desired narrower than in Minorcas, and it is to be hoped that the distinction will be preserved: the special *alertness* of the fowl is really bound up with this and a moderate comb, and all real distinctive characters in a breed should be watched over. The texture of the comb should also be finer and smoother than in the Minorca, and the edge of it thinner: it and the lobe must be cared for as in the preceding varieties, but if the lobe is not too large it will need little bleaching. And there will then also be little trouble from white in face. The thinness of comb and wattles compared with those of Minorcas makes the bird a little more subject to frost-bite in winter: if this should occur, and has not been remedied quickly, the bird should be dubbed at once, or it will suffer much and be no use for breeding.

The chickens are very hardy, but differ much in fledging; some feathering quickly, others very slowly. Their precocity has been already remarked upon. Black and white ones can be weeded out almost at once: two or three months later birds absolutely too light, or dark and smoky, can be selected, and a little later, those with bad combs. Many writers, as hinted already, have supposed that mis-colour comes from crossing with black, and that by long breeding together only blues, blue alone will be achieved. As already pointed out, this can never be the case.

The Andalusian stands very high as a utility fowl. In number of eggs it ranks as high as any of the family to which it belongs; and when not bred to excess in comb or lobes, it will yield its eggs on wide range, or under exposure, where the Minorca fails in comparison. In confinement also it keeps up its character in this respect; many years ago, being applied to for fowls to stock quite a small run at a children's hospital, to supply the little patients with eggs, after some thought we decided upon Andalusians; and for the few years during which we could watch the results and see to the renewal of birds at the proper dates, they kept up their character as most reliable layers. These did not take to feather-eating, though closely confined; but we knew others which did, and this point is perhaps the most doubtful about them as regards confined runs. In flesh they are the best of the Mediterranean family.

As a cross the Andalusian gives broadly about the same results as the Minorca, with less tendency to large combs, and rather more juicy flesh; but its dual character of colour makes the produce much more uncertain in that respect, and it is in comparison very little used.

The greatest mistakes that have occurred in judging Andalusians have arisen from confounding it with the Minorca type. Many judges have done this, and in these days of many varieties it is very important to maintain all such legitimate and real distinctions as exist. About colour and marking there is little or no dispute: the bright blue ground-colour, and dense black uniform lacing are now pretty well understood by all. If in addition to these there be kept in view the characteristic rather slim and reachy form, moderated and rather oblong comb, fine in quality, and rather narrower lobes, there will be little to complain of. The following is the Standard for this breed:

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Moderately long and deep, and inclined to width. *Beak:* Stout and of medium length. *Eyes:* Full. *Comb:* Single, medium size, upright, with deep serrations (broad at their base), the back portion following the curve of the skull but not touching the neck, free from excrescences (or thumb marks or side spikes). *Face:* Smooth and free from feathers. *Ear-lobes:* Of fair size, almond-shaped, of kid-like texture, free from wrinkles, and fitting closely to the face. *Wattles:* Long and broad, and of fine texture.

Neck.—Rather long in proportion to the size of the body, and well covered with hackle feathers.

Body.—Large; broad shoulders and narrow saddle; slightly rounded back sloping towards the tail: full and round breast; long wings, carried well up, and close to the body, and the ends well covered by the saddle hackles.

Tail.—Large and flowing, carried moderately high, though not approaching "squirrel" fashion, and with long and well-arched sickles.

Legs and Feet.—*Legs:* Rather long, the shanks quite free from feathers. *Toes:* Four, straight and thin.

Carriage.—Very upright and active.

Weight.—From 7 lb. to 8 lb.

HEN

With the exception of the *Comb*, which falls over one side of the face, preferably in a single fold, and covering one eye, the general characteristics are similar to those of the cock, allowing for the natural sexual differences.

Weight.—From 5 lb. to 6 lb

COLOUR

Beak: Dark slate or horn. *Eyes:* Dark red or red-brown. *Comb, Face, and Wattles:* Bright red. *Ear-lobes:* Pure white. *Legs:* Dark slate or lead blue.

Plumage.—Ground, clear silver blue, with distinct black lacing on each feather, except that the cock's *hackles, back, shoulders, wingbows, sickles,* and *tail coverts* are black or purple-black, with a rich gloss, and the hen's *neck-hackle* is rich lustrous black, showing broad lacing on the tips of the feathers at the base.

SCALE OF POINTS

Colour of plumage	20
Lacing	20
Size and shape	15
Condition	15
Comb..	10
Lobes..	10
Face	10
	100

Serious Defects: In cocks, much white in face or red in lobes; drab or rusty saddle or hackle; any other colour of legs and feet than light to dark slate; squirrel or wry tail; comb much over; crooked toes; feathered shanks or feet. In hens, erect comb, and any of the above defects which apply.

CHAPTER XXVIII.

LEGHORNS AND ANCONAS.

BRITISH breeders are indebted to America for their first knowledge of Leghorn fowls; but that they really originated in Italy there is not the slightest question. The first White Leghorns were sent to Mr. Tegetmeier in 1870, the birds having taken first prize at the previous New York show of 1868. A second lot of Whites were soon afterwards sent to us by Mr. W. Simpson, and the first pen of Brown Leghorns seen in England were received by us in June, 1872, being sent over by Mr. A. M. Halsted. Other importations of Brown Leghorns were soon made by the Rev. A. Kitchin, from whose stock some at least of the present strains are descended. The Brown variety seems to have been the longest known in America, Mr. F. J. Kinney having stated that he purchased a trio which had come from Italy, in Boston harbour, in 1853; but these birds were brown rather than black-breasted. Some other American writers trace them back to 1835. For many years the White and Brown alone were bred to any extent: of other varieties since, Blacks and Cuckoos and Mottles have undoubtedly been imported, but Piles and Duckwings were made by English breeders. Buffs came to us from Denmark; but it is worthy of remark that for many years birds of Leghorn type have been known in that country and Holland and Belgium under the name of *Italiens*, so that the Buff is probably of more or less Italian origin.

Points and Qualities of Leghorns.

The Leghorn family constitute a group of one of our very best and most profitable laying fowls, though unfortunately some changes that have taken place since their introduction have by no means tended to increase their value in this respect. They have the large single comb of the Mediterranean group, straight and upright in the cocks and falling over in the hens, almond-shaped white ear-lobes, with red faces, and the general type of the class. Their chief characteristic differences are their bright yellow legs, rather smaller size, sprightliness and activity, and greater hardiness. When first imported, the tails were carried very upright, or even squirrel-tailed, which had been the fashion in America; but as we predicted and advocated from the first, that fashion has never been approved in this country, and is now abandoned in America also. Another change is more regrettable. The original Leghorn comb, though of the family type, was moderate in size, and thin and fine in quality: there has been too much tendency towards a large and beefy comb, which has been deplored by every practical writer upon the breed without exception, and has necessitated wholesale dubbing of breeding stock. American breeders have fortunately never adopted this fashion, which has gravely affected the egg-average of some strains: and it is to be hoped that some little reaction lately observable may continue, and the more moderate American and Italian comb again prevail. Breeding for size has also, in some cases, been carried too far, the largest birds by no means laying the largest eggs, and being inferior in activity and hardiness to those of more typical size.

Leghorn chickens are very hardy, and feather easily. Some of the cockerels weigh 6 lbs., and few are under 5 lbs., and the flesh is by no means bad eating, being more juicy than that of the Minorca. The great usefulness of this group is however as exceedingly hardy, non-sitting, laying fowls, whose eggs are large for the size of the bird, even small Leghorns rarely laying eggs less than 2 ozs. in weight, and many decidedly heavier, though (as just observed) the largest by no means lay the best ones. Both Mr. Tegetmeier and ourselves reported upon the first specimens received as amongst the very best layers we had met with; and except in some strains which have been injured by crossing for show points, this character has been preserved, and is always easily bred up to. The White Leghorn is renowned in the United States and Australia as a breed which, bred for laying and adequately fed, is easily got up to an average of close upon 200 eggs per annum, while these eggs are of a good marketable size; it has the current name there of being "the business hen," and divides with the Wyandotte and Plymouth Rock nine-tenths of American poultry-farming. It has the further valuable property of maturing early, and at a very uniform age, so that if adequately fed pullets may be depended upon to lay before six months old. They can be forced much earlier, but this is not advisable, and it is far better to date the time of hatching accordingly.

The breed is not much used as a cross; but that with the Houdan is known as an excellent layer and fair table-fowl and it is worthy of notice that the produce of a White Leghorn cock with a Barred Rock hens has produced the only actual record known in England of an average of 152 eggs per annum from an entire flock of as many as fifty hens.

Before proceeding to the individual varieties of Leghorns, it may be well to remark that there is one natural difficulty in breeding them all. This consists in the natural antagonism between bright yellow legs and pure white ear-lobes. For some years attempt was made to get recognised cream or ivory (not yellow) shade in the ear-lobes, but it was ineffectual; and there is little doubt that a cross with the Minorca, which is known to have taken place, was introduced partly with a view to whiten the lobes. By this cross was introduced more coarseness, with some loss of the original sprightly type. The real difficulty now is in regard to the yellow of the shanks. There was also an attempt, many years ago, to tolerate straw plumage in Whites, as natural to yellow-legged breeds; but that also was ineffectual, and this particular difficulty has undoubtedly been somewhat lessened by the whitening of the lobes. It is certain, at all events, that with the establishment of white ear-lobes the plumage of White birds has improved in colour.

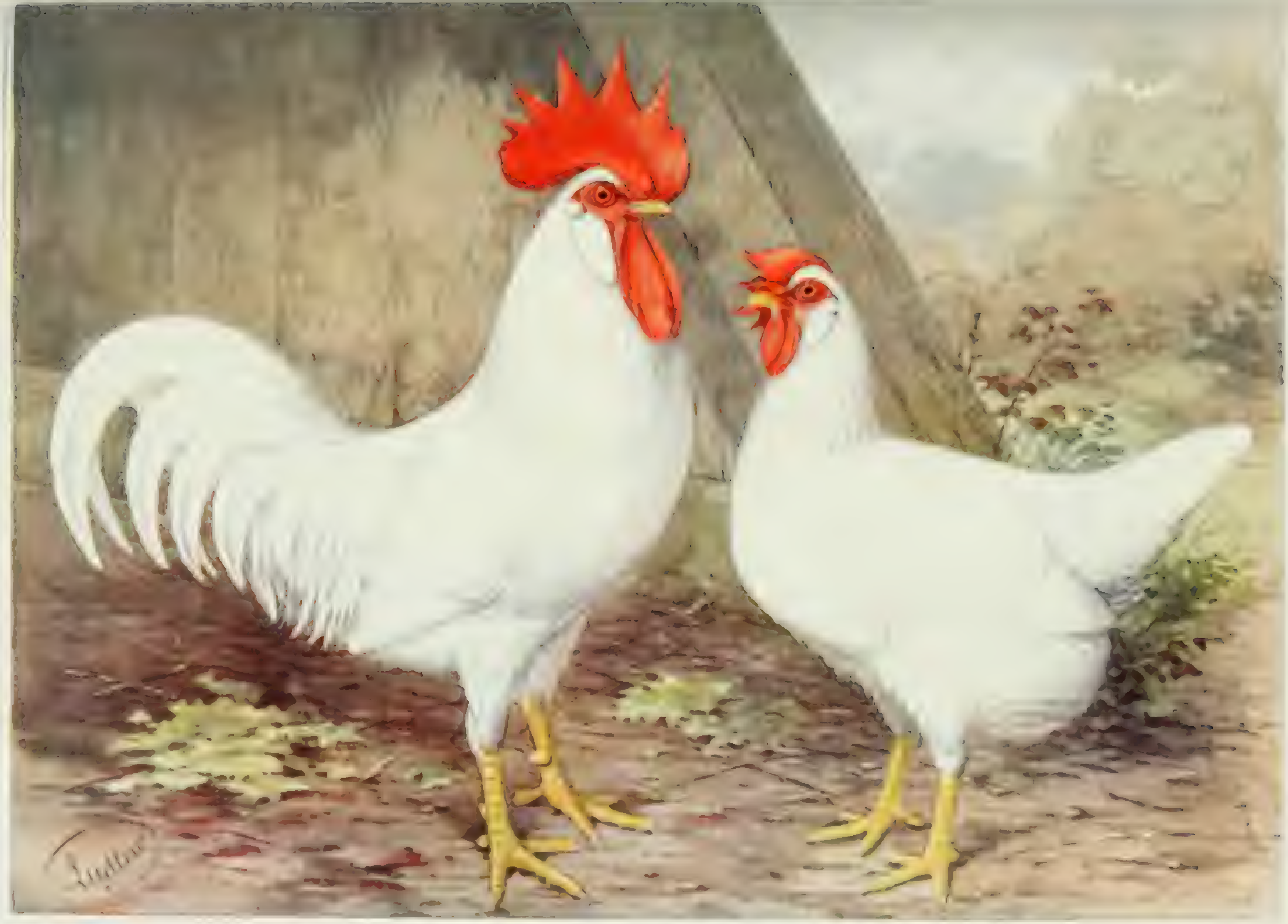
White Leghorns.

Of all the varieties of Leghorns, the White has been longest known in England. It has become much larger than when first imported—many think too large—and it has suffered as much as any from large overgrown combs, which bow down the necks of the poor birds in too many pens; but we have said enough on this point. Mr. F. Tootill, so long associated years ago with the late Mrs. Webster's successful stud of White Leghorns at Horsforth, and later as founder of the present successful stud owned and exhibited by his firm, Messrs. Whitaker and Tootill, of Pool, Yorkshire, has kindly supplied the following notes on this variety:—

"It is with pleasure that I consent to supply a few notes respecting the leading and most popular variety of Leghorn. In doing so my desire is to assist the amateur and breeder, and to further the interests of the breed; and with this end in view any little knowledge I possess is most freely given, and I am in hopes that from the perusal of these notes those for which they are intended may derive benefit.

"During the past few years the White Leghorn has been much improved, to such an extent that at present shows it is no uncommon thing to find specimens staged which are equal, both in size and head-points, to our best Black Minorcas. In fact, this has been carried so far that it has been questioned, and has been the cause of long and heated controversy, whether breeders were not now losing that beautiful stately carriage of the typical Leghorn in their desire to obtain size. Size is difficult to secure, and, when once obtained, a breeder has reason to be pleased with the result of his exertions; but we must have *type* in conjunction with it. Experience tells us, however, that it is little use nowadays to exhibit the small 'pretty' whites, our judges signifying their requirements by their invariable decisions in favour of size, sometimes in preference to head-points and general quality. This applies more particularly to the all round judge, and is to be regretted, as type and quality should always have prominent consideration. Only on one occasion, in my experience, has any specialist judge been so infatuated with mere size as to have given the preference to a huge body and ungainly carriage against a perfect head, with good shape, on a smaller body; but as this was at one of the most important shows of the season, such a decision may have a considerable effect on breeders. The position of judge is as important as the task is an unthankful one, and specialist judges at our principal shows should not lose sight of the fact that they have, to a certain extent, the destiny of the breeds on which they adjudicate in their hands. In White Leghorns, some years ago, there was some foundation for the view that in consequence of the tendency above noted we were threatened with loss of type, the all-important feature. I am glad to say now, however, that breeders are paying much more attention to shape than formerly.

"Although it is a characteristic most difficult to put down on paper, the shape of a Leghorn is totally distinct from that of a Minorca, just as the Andalusian is. In breeding I make this feature as important as purity of colour. I place vital importance on type and colour, because a Leghorn ceases to be a Leghorn when it is not typical, just as it ceases to be a *White* Leghorn when the colour is impure. It has been suggested that, to secure the size of present White Leghorns, foreign blood has been introduced, such as that of the White Rock, White Malay, etc., etc.; but this



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WHITE LEGHORNS

theory loses weight when we look at the perfect head-points which have been shown simultaneously with increased size. I consider the improvement to be seen to-day in the White Leghorn—and it will be readily conceded that the breed was never nearer perfect, the Champion Trophy offered by the Poultry Club at the Crystal Palace for the best male being won at the 1910 show by a White Leghorn—is evidence of the breeder's art, and a result of what has been done by careful selection and careful breeding.

"The time is long past, too, for one to be able to win in anything like decent competition with Leghorns of the straw-coloured variety, pure colour being demanded by every judge. This can only be obtained by breeding, discarding *all* inferior-coloured specimens (no matter what other good points they possess) when selecting one's breeding stock. If any degree of success is desired, this, as I said before, is specially important, as when a Leghorn is not a pure white it is not a *White* Leghorn.

"The White Leghorn has seen improvement in more characteristics than size and head-points. We now have the cocks much more heavily clothed in feather than in former years. Few are exhibited to-day with scanty hackles, and close whip tails with narrow sickles. A White Leghorn requires to be furnished with long, flowing sickles and secondaries to be a thing of beauty. Scant feather looks particularly amiss on the larger specimens, and strange to say these are generally the ones that are deficient.

Breeding White Leghorns.

"To breed White Leghorns a large financial outlay is not needful. What is principally required is sound common-sense in the selection of stock. It is a breed that is hardy, and will flourish under ordinary conditions. Apart from being a show bird, it has utility advantages, the Leghorn being a recognised egg-manufacturer. And good birds sell well. During the past few years the prices for good specimens have gone up a great deal. Where £5 was originally considered a high price, we have now £10, £15, and £20 paid for single specimens, whilst on one occasion I sold a well-known hen for £50; and if this latter figure may be a record, £20 is not considered now to be a very exceptional price for a pair of exhibition birds.

"From the novice's point of view the White Leghorn has an advantage over most other breeds, and even over other varieties of this breed, inasmuch as exhibition cockerels and pullets can be produced from one pen. Pure white being desired in both sexes, no special blending of colours is required, as in Browns or Piles. Some breeders have two distinct strains for cockerel and pullet breeding, and if a breeder only uses one pen, it may generally be noted that he is more successful with one sex than the other. On many occasions, however, I have produced several winners of both sexes from one pen, but where there is convenience the breeder's object may be more speedily attained by mating up separate ones. The most important features are colour, shape, head-points, and size. For producing cockerels, I would advise mating an extra smart-headed cock, with a firm, upright comb, carrying plenty of feather, with correct shape, and stylish, to large hens, the head-points of the latter—beyond a small, neatly serrated comb and a tight fitting lobe—not being nearly so important as in the cock. Although I like size in a cockerel-breeding male bird also, I find that it is not so necessary as in the hens, but he must be well furnished with feather. It should be stated here, too, that in cock breeding, quality must be the watchword, and young, vigorous birds should only be used in the breeding pen. Old stock is generally responsible for coarse progeny. In selecting a male bird for pullet breeding, I look for size in conjunction with colour, a fair length of limb, and plenty of head-points. When I say this I do not mean an overabundance of comb in particular, but one of fair size, with a good, strong, thick lobe and a fair length of wattle. It is immaterial whether the comb is carried upright or over, so far as pullets only are concerned, but it must be well serrated. Abundance of feather is not so necessary as when breeding for cockerels. The hens should be big and shapely, with heavier head-points than the cockerel-breeders, paying particular attention to lobe, as I think that the pullets, speaking generally, at the present time, are wanting more in this respect than any other, while the cockerels are far superior in this point. I like to see a good lobe on either a White Leghorn or Black Minorca, together with a sound face. It is, however, difficult to get as yet, though improvement is perceptible every year.

"I prefer dubbing my male birds, and breeding from second season birds of both sexes, as, by following this practice, I get the best results. To fix a strain, I advise judicious in-breeding, as oftentimes the introduction of new blood has disastrous effects, and when a breeder has laboured hard for many years it is very disheartening to have his work undone by a single season's breeding.

"In the necessary washing of White Leghorns for show, the first wash often brings out a distasteful yellow tinge known as 'sap,' that should wear off with a few good baths; but, if not, the bird may be discarded as useless."

Brown Leghorns.

The colour of the Brown Leghorn as first bred in America was very uncertain, some of the first imported specimens having a great deal of brown in the breasts of the cocks. This was however gradually bred out in favour of the black breast; and for many years the accepted colour has been what may generally be described as that of the black-breasted red Game, with the exception that the cock's hackles are somewhat darker, or orange-red, and should have a little black striping near the shoulders. This colour resembles that of the Game cocks before these were bred quite so bright, and there is no doubt that several crosses with black-breasted red Game were employed at different times, to improve and fix the colour and marking. The effects of this crossing are still seen occasionally in pullets with dark legs and feet (from the willow legs of the Game), and as this fault is especially obstinate, specimens which exhibit it should be carefully avoided in breeding. It is less common now than a few years ago.

For the following article on Brown Leghorns and their breeding, we are indebted to Mr. L. C. Verrey, The Warren, Oxshott, Surrey, whose connection with the fowl is probably longer than that of any other living breeder:—

"The Brown Leghorns, like their brethren the Whites, are of pure Italian origin, but like them, did not come to us from their native country, but from America, where they had been bred for many years before being imported into England. They were at first there called 'Red Leghorns.' Their prolific egg-producing qualities soon brought them such a reputation that they were eagerly sought after, and constant importations from Italy had to be made to supply the demand. Since the first Brown Leghorns in England arrived from America during the year 1872, they have been cultivated with ever-increasing energy.

"Though their general characteristics and prolificacy have been fully maintained, the type of the fowls has been greatly changed in England, so that, at the present time, the English and American types differ to a large degree; the latter being more sprightly and of slighter build. The English idea seems to have been to make them more of the Dorking than the Game type, and consequently the modern English Brown Leghorn is much heavier in build than the original. Unfortunately, Game and also Minorca blood was introduced into the Brown Leghorn some few years ago, with a view to improve colour of plumage, size of lobe, and size of body; but this infusion of foreign blood has done more harm than good, and much of the existing darkness in feet and toes and white in face is attributable to these causes.

Points of Brown Leghorns.

"The colour of the present-day Brown Leghorn has also suffered by the use of very light-coloured hackle cocks for stud purposes, so that the thick black stripes which form such pleasing contrast to the ground colour of golden bay have been almost lost, and it is rare to see a really well-striped hackle. This striping in the neck and saddle hackles, more especially in the former, is one of the points that American breeders have been most careful to maintain, so that a Brown Leghorn cock with a plain hackle is considered of little worth across the Atlantic. The large over-developed combs of both sexes that are now prevalent are also totally at variance with the combs of the original type, which were, though large, quite in proportion to the head. These are some of the points wherein the ancient and modern types differ, and are set forth to illustrate what the art of the fancier can do by studied selection of the breeding stock, combined with the infusion of alien blood.

"We now come to the colour-points of the cock. The head should be fairly deep, whilst the beak should be rather long and straight, of a yellow colour, though horn-colour, or a stripe of horn-colour running down the centre of the yellow, is quite permissible, and will be found in nine instances out of ten. The comb is single, fine in texture, large in size, deeply and evenly serrated. There is no definite rule as to the exact number of serrations, but the most symmetrical comb is that which has six. The comb should be firmly set on, and extend well over the back of the head. Unfortunately, the desire to have pullets with the largest possible combs has had a harmful effect on the combs of the cocks, for not only has it made them too heavy, but has caused them to become bulgy, and thus create a hollow near the front, which is commonly called a 'thumb mark.' The face should be bright red, quite free from wrinkles and white specks or spots. The eyes red, bright, and sparkling. Wattles rather long and thin, fine in texture, and without folds. In the colour of the ear lobes we have gone away from the original, for now it is decreed that they must be pure white, while in the pure Italian Leghorn they are yellowish white, or cream colour, which certainly is in greater harmony with the bright yellow legs. The lobes should be rather of the almond shape, that is, pendent, smooth, and resembling a piece of white kid. The breeding for tremendous lobes has been the cause of that unsightly blemish, 'white in face.'

"Coming to the plumage, the neck should be well furnished with hackle feathers, which fall gracefully on to the back, the colour of these being golden bay, each feather having a fairly broad stripe of black running down the centre, though the shorter feathers near the head and round the throat are without any striping. The feathers on the back are a deep red, almost crimson, this same colour running over the shoulder coverts and wing bows. The wing coverts are a beautiful bluish violet tint, and form a broad, even band across the wing, commonly called the wing-bar. The primary wing feathers are brown, the secondaries being a very deep bay on the outer and black on the inner web, the bay being the only colour seen when the wing is closed. The saddle feathers are a very deep orange-red, some of them having the black stripe down the centre as in the neck hackle. The breast and thighs a rich glossy black with a slightly greenish hue. This same colour pervades the underparts, though getting of a less glossy nature near the tail. The tail, which should be carried well up, though not squirrel fashion, is of a rich greenish black all through, being surrounded at the base with grey fluffy feathers, whilst the tail coverts are black edged with brown. Legs long and slender, of a brilliant yellow.

"The foregoing are the plumage colours of a typical Brown Leghorn adult cock, but these feathers will not be found in young cockerels when just feathering. The first feathers are nearly always brown, splashed with more or less black, the breast being especially so, and not infrequently the little tail feathers will be margined with grey. As the young birds go through their first change of feathers, the breast and tail assume the metallic black of the adult. Should there be any considerable amount of white in the wing, however, the bird may be considered a 'weed' and not worth keeping, for in nine cases out of ten this white will increase as the bird grows, and is a fault that should not be tolerated.

"Perhaps there is no more graceful and soft-coloured hen to be found than the Brown Leghorn; its elegant, symmetrical outline, covered with the most delicate coloured plumage, the tones of which blend with each other in the most perfect harmony, cannot fail to attract admiration from even those who care little for the beauties of nature. To describe the colour points of the hen is somewhat difficult, for the pen cannot really do full justice to the beautiful soft tints that exist in the plumage of a typical specimen.

"The comb of the hen should be large, of fine texture, and evenly serrated. It should rise straight up for a short distance from the head, and then bend gracefully over to one side. The beak should be yellow or horn-colour; the eyes bright and sparkling; the lobes white and as large as possible, but fitting more closely to the head than in the case of the cock. The wattles of fine texture, free from folds and nicely rounded.

"The neck is well arched and abundantly furnished with hackle feathers, the colour being of a rich yellow or golden tint, with a sharp black stripe running down the centre of each feather. Though the stripe should be fairly broad, the yellow or golden colour should predominate. The tendency of late has been to breed hens with light hackles, and consequently much of the sharp definition of the black has been lost. The colour of the breast should be a salmon-red, the feathers on the throat being of a deeper tint, but these graduate in tone until they mingle with the salmon-red of the breast. The feathers on the under-parts and on the thighs are an ashy grey. The body colour is a soft light brown, clearly and beautifully pencilled with fine black lines, resembling the markings of the partridge. The wings are of the same delicate colour when closed, but when open the inner web is black. The great difficulty is to get the wing solid in colour, for many otherwise good hens are disfigured by deep brown-red patches, which are commonly termed 'rust on wing.' The wing is the home of the chief faults that are to be found in the Brown Leghorn hen, for not only is the rust apparent on the outside, but very often many of the flights will be found to have more or less white on the inner web. A pullet with white in flights may be considered a weed, for in hardly any instance will this diminish with age, but will rather increase with each successive moult. The tail should be carried at a very slight angle, almost upright, the feathers black, some of them being pencilled with light brown, or having a light brown edging on one side. The legs and feet are bright yellow, free from black spots or scales.

"To produce Brown Leghorns of standard colours, it is necessary to mate two pens of stock birds, the one for cockerel and the other for pullet breeding, as it is not possible

Breeding Brown Leghorns.

to produce both of equal merit from one mating. For producing the most typical cockerels it is necessary that great attention be paid to every detail when mating up the pen. The stock cock should be in all main points an exhibition specimen, with an evenly serrated comb, good open lobes, and a perfectly sound face, and no white in face should be tolerated in a one-year-old bird. His hackle should be bright in colour, with the black striping sharply defined, but not heavy. The breast should be solid in colour and perfectly free from white splashes. Such a cock should be mated with large hens (size being very important), of the light brown colour, with fine though distinct pencilling. A shade of warmth or rust on their wings will not matter; in fact, it is preferable, as it helps to give a warm tinge to the colour of the progeny. The combs of the hens should be firmly set on their heads, only medium in size, and well and evenly serrated. Combs that fall half to one side and then double over and fall in the opposite direction should be avoided for cockerel breeding, as they often cause malformed combs in the cockerels. The hen's ear-lobes should be large and smooth. The carriage of the tail is an important point, for a high-tailed hen will most likely produce squirrel-tailed cockerels, so that hens should be selected which carry their tails rather low.

"For pullet-breeding, the stock cock should be of a more sombre colour, the hackle being deeper in the golden bay, and more heavily striped with black. The breast may be slightly splashed or ticked with brown, and this will even be found an advantage, by the production of deeper colour on the breasts of his offspring. Such a cock should be mated with rather light but perfectly sound partridge-coloured hens, which should be absolutely free from any rust or warm tinge on the wings. Their combs should be large and gracefully carried, the lobes as large as possible, and the legs bright yellow, entirely free from dark spots or scales. This mating will produce even-coloured pullets, but the cockerels, with scarcely an exception, will be of no use except to be retained as pullet-breeding stock birds.

"If a two-year-old stock cock be used, it is well to mate him with one-year-old hens, and, in the case of a cockerel, his mates should be two years old."

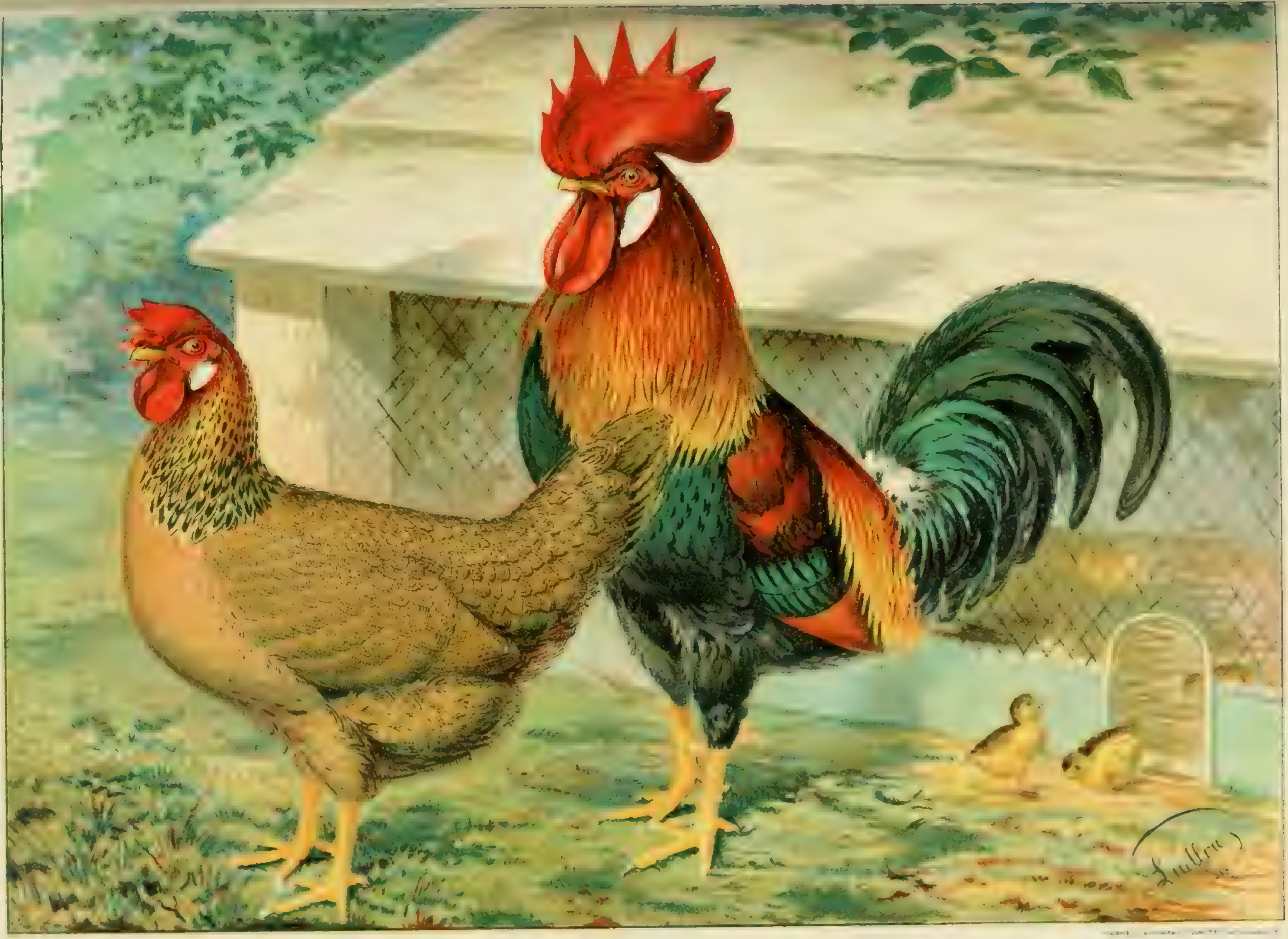
Pile Leghorns.

Pile Leghorns should probably come next in date, having been produced by crossing Whites with Browns, in the same way as were first produced Pile Game. It was in 1881 that Mr. G. Payne mated up his first pen of White and Brown; but it was not until January, 1886, that he was able to exhibit two pullets and a cockerel, the latter being poor, but the pullets good. At the Dairy Show of that year, however, he produced two pairs of Piles which left little to be desired, and took first and third prizes in a mixed class; and for a time the colour was fairly popular. Other crosses have been introduced by various breeders at one time or another. The article below speaks of a Game cross, and its effects on the type of the strain; and perhaps one of the most remarkable "flukes" in the history of poultry-breeding was the colour and success of some Pile Leghorns exhibited in "the 'nineties," which the breeder himself stated to be bred from a cross-bred bird deriving parentage from the Light Brahma! This cross probably accounts for the feathered legs seen on a cockerel at the Palace Show in 1894; but we have a vivid recollection of the colour shown by this exhibitor for one or two seasons, which was marvellous. There can be no real occasion for crossing any further.

The notes which follow on this variety were supplied in 1900 by Messrs. H. and A. P. Simpson, of Ilkeston, whose success in breeding and exhibiting will be remembered:

"Pile Leghorns have made rapid strides in public favour during the past few years. They were first originated by Mr. G. Payne, about 1886, being the result of several years' crossing between the older established varieties of White and Brown Leghorns. For several years they moved very slowly in the estimation of the public, probably owing to the difficulty of producing a good percentage of birds true to type and colour; but as the result of careful breeding and untiring attention by a few fanciers who have not failed to recognise the merits of the variety, they appear to be now well established, and the number of mis-marked chickens considerably diminished.

"It may be interesting to record that our particular strain of Pile Leghorns were produced from a Pile hen which we bought from Mr. A. C. Bradbury, in 1891, undoubtedly a cross between his White Leghorns and Pile Game; but we never ascertained in what manner the cross was made. This hen was mated to a Brown Leghorn cockerel, with the result that we were fortunate enough to breed prize-winners from her during the first season. We continued to mate her and the pullets bred from her with Brown cockerels, until we obtained a fixity



9

BROWN LEGHORNS

of colouring, and more of the Leghorn style and carriage. There is no doubt that this cross-bred Game hen has transmitted to her progeny a certain raciness of character, for which they have always been noted.

"From the year 1894 we bred Piles and Piles together, and have been successful in producing good cockerels and pullets from the same pen. We have occasional recourse to a Brown cockerel for change of blood, and when this has been necessary we have made up a pen of specially selected pullets, the offspring from which have been carefully kept apart from the other stock, and during the following season the cockerels have been mated with Pile-bred hens, and the pullets to Pile-bred males. The result from this system of introducing new blood has been generally satisfactory. Some fanciers prefer to use a Brown hen for this purpose, but we have not tried it, as the method described above has always been attended with good results.

Breeding Pile Leghorns.

"So far as the breeding pen is concerned, it is only necessary to say, Let its occupants, males and females, be as perfect of their kind as it is possible to get them. We rarely mate up any birds that are not fit for the show pen, the exception, perhaps, being in the case of a bird possessing some strongly developed essential characteristics, which it is desirable to perpetuate; and even then it is better to allow a separate mating, so that the results may be more carefully noted. A few good birds, judiciously chosen, will give far better results than a larger number.

"The beautiful combination of colour in Pile Leghorns will always commend them to fanciers, while from the utility point of view it is difficult to surpass them. They are strong and hardy, and thrive well in close confinement; they lay an abundance of good-sized eggs, and, of course, are non-sitters like all the other varieties."

The chief difficulty in breeding Pile Leghorns, we understand, is to get the pure white breast and tail in the cocks, and clear wings in the pullets. While seeking for these points specially, equal care should be taken to select a male bird whose back is as dark as possible. A few mate up different pens, choosing dark-breasted rose-winged hens by preference for cockerel-breeding, and lighter hens for pullet-breeding. It is when richness of colour seems quite to have run out, that resort must be had to a cross from the Brown, as in Pile Game.

Duckwing Leghorns were also produced by Mr. G. Payne. It is true that a cockerel of this colour was shown at the Palace in 1886 by Mr. Terrot; but this bird was acknowledged to be an almost solitary cull from a cross between Silver Grey Dorking and Duckwing Game, and no other results from that experiment were ever seen; whereas Mr. Payne's birds brought out the following season, quite differently bred, were but the forerunners of a number more, which took hold as a popular variety. They were stated to have been first originated from some of the wasters bred in producing Piles from Whites and Brown Leghorns, which had come with salmon breasts, and a brownish blue all over the body, with brassy hackles and ashy grey under-parts. After exhibiting the birds thus bred for a season or two, Mr. Payne visited Antwerp in January 1889 with a collection of his birds (his Duckwings taking first and medal there), and obtained at the Zoological Gardens a cock for crossing of the long-tailed Japanese Phœnix or Yokohama breed, of silver-grey colour. This cross effected very great improvement in colour, but its effects were seen for several seasons in sickles which swept the ground, and which were only gradually bred out again. From the produce of this cross was selected the bird which won at the Dairy Show that same year, and was purchased by the late Mr. Hinson, to whom and to Mr. Gerahty the further breeding of this beautiful variety is mainly due.

Duckwing Leghorns.

The colour of Duckwing Leghorns is in all but one point practically the same as in the corresponding varieties of Duckwing Game. That point is the striping of the hackle: as the Brown Leghorn is a striped breed, so the Duck-winged varieties have the longer feathers of the hackle somewhat striped also. Mr. Payne had made no attempt to breed Golden and Silver strains, but as the variety was bred more generally this became inevitable. A good gold-coloured cockerel almost always bred pullets red or rusty on the wings; hence pullets had to be bred from lighter or more silvery cocks. And conversely, good-coloured Gold cocks could only be produced from more or less rusty females. Both classes are now recognised by the Standard, and are necessary for breeding, but at the majority of shows, where there is one "Duckwing" class only, the winners are usually Golden-Duckwing cocks, with almost silvery hens.

Silver Duckwings, so Mr. Hinson wrote us, are usually bred from one pen, the same mating producing both sexes good if the strain is well bred, and the colour and markings sound on both sides. Where this is not so, somewhat inferior colour in either, or in both, often breeds

Breeding Duckwing Leghorns.

very fair pullets, though failing in cockerels. Pure silvery white in the hackles of both sexes is the great criterion. The best mating of all is that of a silvery-hackled cock with a rather dark grey but absolutely pure-coloured hen.

To breed Golden Duckwings, two pens are practically requisite, though not so much so as before the rich golden wing-bows now sought in the cock, had replaced the deep maroon or crimson once fashionable. For cockerel breeding it is best to select a typical Golden exhibition bird, sound in all his colours, and put to him hens with rich salmon breasts, and which may with no detriment have a little warmth or rust on the wing. For breeding pullets, the cock should be bred from Golden pullets, very sound in his black all over, but rather light on shoulder, and is none the worse if rather broken in colour there: if his hackle also tends to being silvery it is all the better. His mates should be pure in colour, as near as possible to ideal exhibition hens. If at any time too much colour comes in the hackles of either sex, or the bodies of the hens, a cross of Silver Duckwing blood is desirable.

Buff Leghorns.

The first record of Buff Leghorns is at the Copenhagen Show of 1885, and the first hen exhibited in England, at the Palace Show of 1888, also came from Denmark; but these birds were known in that country as yellow *Italiens*, and there is no doubt of their Italian origin. The Palace hen was purchased by Mr. L. C. Verrey, who subsequently procured other stock, and bred them in England: Mr. Penfold Field also had early Danish stock. After a year or two nearly all the good Buffs came into the hands of one breeder, who however refused to dispose of either eggs or birds in England, though exporting to America; and this course retarded any progress in England considerably. Subsequently Miss Pulford (the late Mrs. R. T. Thornton) succeeded in procuring a good strain, and Messrs. Bateman and others also imported from America, where the variety had been well taken up; and with this extension of Buff blood amongst a wider circle, improvement became more rapid, aided in point of colour by one or two out-crosses from Asiatic sources.

Buff appears to suit the Leghorn type especially well, and in no variety is the colour more singularly attractive, the close but not short plumage giving a soft silkiness of texture which is not seen in some other breeds. For the following notes on Buff Leghorns we are again indebted to Mr. L. C. Verrey, who was, as stated above, the earliest to breed them in this country.

"Of all the sub-varieties of Leghorns, none has been taken up with so much zeal as the Buff, nor has any of the varieties been so much improved by the infusion of alien blood; for the first Buffs imported into England were different from those seen at the present time. The art of the breeder has produced a solidity of colour which did not exist in the original specimens; and it is very interesting to note how this uniformity of buff has been obtained. It was in 1888 that the first Buff Leghorn was seen in England, and this was a hen exhibited by an enterprising Danish fancier at the Crystal Palace show. The bird was full of true Leghorn characteristics, and of a very nice even lemon-buff colour. She was claimed at the show; and the exhibitor was applied to for a cock and more hens of the same description; and in due time a consignment was received. The cock possessed excellent shape and size, but was very deep orange, or nearly red on the back and rather light in the hackle, whilst his tail was white, with each feather having a line of buff running round it. The whole plumage was striking in contrast, but it could hardly be considered a pure 'buff' in the sense that we now use the word. More birds of this variety were procured from the same source by other fanciers, and every effort was made to improve and intensify the colour by crossing with other buff breeds. So far as the colour alone was concerned, these methods answered well; but the Leghorn shape was lost for a time, and red-lobed, feathered-legged chickens were of very frequent occurrence. By judicious breeding and inbreeding these faults were gradually diminished, and now we have birds of both sexes even in colour, and possessing true Leghorn characteristics.

"The Buff Leghorn cock should have the same kind of comb and colour of beak and legs as the Brown or White varieties, whilst his plumage colour should be either a lemon or orange buff, the breast feathers being a little richer in tone than the back, but certainly not in any great degree such as to form a decided contrast. The whole plumage, whether of the lemon or orange shade, should be quite even and free from mealiness, and the tail should be solid in colour, perhaps a little deeper in tone, but free from white or black, or partly white or black feathers.

"The Buff Leghorn hen should possess the same characteristics as to head points, style, shape and colour of beak, lobes, and legs as the Brown hen, whilst her plumage should be an even shade of buff all through, without variation in any part, though in many specimens the hackle will be found to be a shade or two deeper in tone than the body.

"Undoubtedly the infusion of the foreign blood already mentioned will make itself apparent now and again, and the reappearance of slight feathering on the legs, red in lobes, and white in flights and tail, are to be expected; but by very careful mating up of the breeding pen and persistent weeding out of the faulty specimens these evils will be overcome, and the certain production of solid coloured Buff Leghorns will be established.

Breeding Buff Leghorns.

"In selecting Buff Leghorns for breeding, great attention should be given to the head points of both the male and female, for up to now these have been comparatively neglected, the chief aim having been to produce uniformity of colour. Now that this has been established, the improvement of comb and lobes, especially the latter, requires earnest consideration. The stock cock may be a little deeper in colour than the hens that he is to be mated with, but he should not be too dark, particularly if the hens are inclined to be a light buff, for the extremes of shade never amalgamate well, and the progeny are apt to become mottled when they assume their adult plumage. Whether the birds be lemon or orange buff, they should all be about the same shade, excepting as stated above, that the plumage of the cock may be a little richer in tint. Hens that show any amount of mealiness should be discarded, as should also those that have decided black ticks at the ends of the hackle feathers, or on the tail feathers. Too much stress cannot be laid on the under-colour, and every stock bird should be closely examined to see that the buff extends well into the under plumage; for very often though the surface may be all that is desired, the fluff will be found to be quite white. Should the buff extend almost to the skin, there is but little fear but that the progeny will come sound in colour throughout. The tail of the cock will probably prove the greatest difficulty, this being especially the home of white and black feathers. Though both are faults, yet the former is the greater, and likely to be reproduced in a larger degree than the latter. Still, as really sound coloured tails are even yet the exception, choice should be made of the bird that has the least white in the main feathers of his tail."

Black Leghorns.

Black Leghorns are generally believed to be pure Italian blood, importations having been traced direct to Italy, and also to Belgium and Germany, which both import Italian fowls. As a rule, they are a rather wild race, great flyers, and very hardy, in many respects resembling the Ancona, as also in their quality as layers. The great difficulty is to get the pullets with yellow legs; with cockerels there is not the same difficulty, as remarked in the following notes upon this variety kindly furnished by Mr. Nelson King, Chorley House, Clitheroe.

"The Black Leghorn as a variety ought to be better known for its qualities than it is at the present time by the majority of poultry fanciers. It is an exceptionally hardy bird to rear, and bears confinement well, and is a splendid all-round layer. I have had pullets, hatched in April, commence to lay at four months old, laying a good saleable white-shelled egg, and continuing to do so through the winter months. Frost and snow seem to have no effect, the birds being out both day and night all through. I have had young cockerels to crow at 39 days old. They are very active, and the birds at liberty are splendid foragers and small eaters. Fifty pullets or hens in a field make a splendid sight to see, with their jet black bodies and bright yellow legs. They always seem to be on the alert, and will take wing at times for fifty or seventy yards. They are rather of a wild nature when at liberty, and scarcely approachable. I firmly believe that a hundred and fifty Black Leghorns will equal two hundred of any cross-bred birds brought to compete against them; that is, for egg production. I have also had cockerels weigh 5¼ lbs. at five months old, and the flesh is white and juicy.

"The chickens are easy to rear, and free from disease. They are generally dark, with white underparts when hatched, the majority then having dark legs, but becoming yellow as time goes on, more so with the cockerels than with the pullets. The chief difficulty in the cockerels is that they are subject to white in their tails; but this is greatly improving. I have possessed birds with sound black tails, but they have been wrong in other things, such as being inclined to show red feathers, or bronzy looking on the back. I always try to breed from a cock bird that has the least white in tail, but still having a good sound rich black body colour and good yellow legs. The bigger the lobe is the better, as we are still wanting in this particular point, especially in pullets, but the birds are as a rule quite sound in face.

"In mating a pen of Black Leghorns together, I should advise to get a big sound-coloured bird, with good face, ear lobes, and leg, and as little white in tail as possible. A cock of this description mated to six pullets with good sound black bodies and good yellow legs, and good lobes and nice folding combs, will breed birds for prizes in the show pen.

"As to the Standard for Black Leghorns, the plumage should be a rich glossy black, free from feathers of any other colour; the more sheen the better. Legs and feet yellow; eyes bright red; beak and toe-nails yellow or horn-colour; comb, face, and wattles a bright red. Size as large as possible."

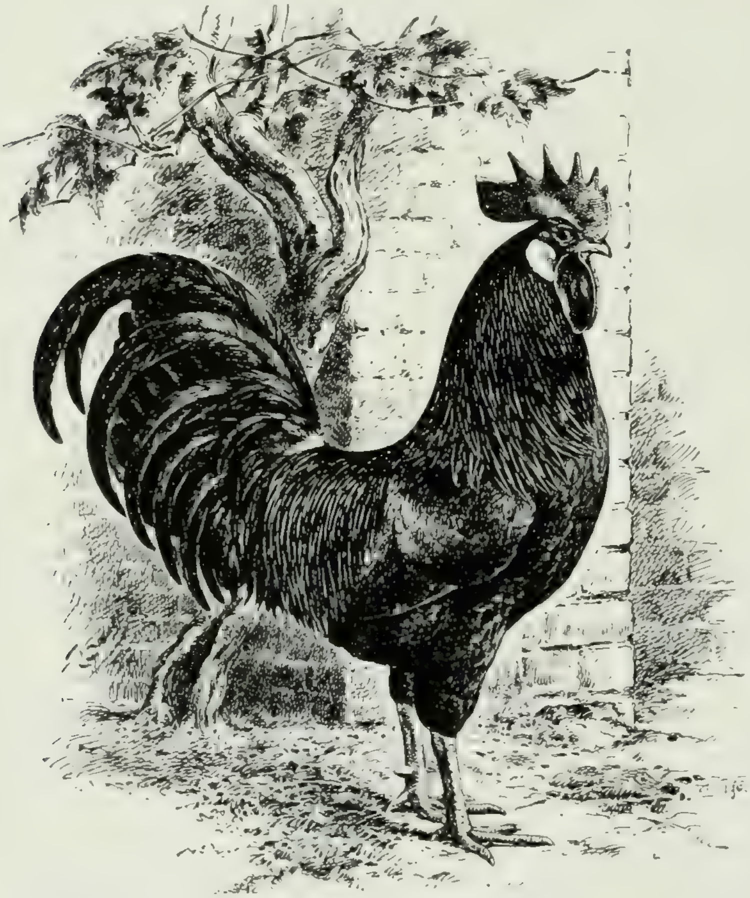


Fig. 121.—American Brown Leghorn Cockerel.

Cuckoo Leghorns.

Cuckoo-coloured or blue-barred Leghorns are occasionally seen, but are not popular. They appear to have come chiefly from the Continent, and to have occurred naturally from mixture of black and white, as so many other similarly-coloured races have done. There is no doubt that they are just as good in qualities as other Leghorns. but the colour does not seem in this variety to be attractive, and, there being no adequate support for it in classes, it is little cultivated. It is a difficult colour to produce in this breed, white and other foul feathers constantly occurring. This difficulty is not now found to the same extent in the barred Rock, which has been bred for colour and marking through many generations, and in large numbers; but in a variety so little bred as the Cuckoo Leghorn it is felt severely. With such stock as is obtainable, we should advise selecting two-year-old birds (that age often showing up faults not seen in the chickens), weeding out severely for any foul feathers, and selecting the medium colour and barring in both sexes. Strains are not fixed enough to breed by the same rules as barred Rocks, and this course will be found on the whole most successful.

Mottled Leghorns are also rarely seen, but are likely to be displaced by the Ancona, if not practically the same bird.

American Leghorns.

The Leghorn is bred and kept in America and also Australia to an extent quite unknown in England; but the birds there generally are different from the English style, far nearer the original type, and, as a rule, more prolific. In one respect English type has prevailed. All the first birds sent to England were very high in tail but we from the first advisedly opposed that style, as sure to be fatal to the fowl if adhered to, and the result has fully justified our action, which happily proved decisive at a time when the question hung in suspense. On both sides of the Atlantic the flowing tail is long since fully recognised. But the American Leghorn differs in other respects. It remains considerably smaller than the Minorca, and is also rather higher on the leg than the English, of rather more slender form and sprightly carriage, and with the much more moderate comb of the original bird. These differences are well shown in the drawing by Mr. Franklane Sewell of an American Brown Leghorn cockerel, first prize at Boston in 1900, for which we are indebted to *The Feathered World*.

There are also some differences in colour. Buffs in America, at the time we write, are one or two shades lighter than the orange buff popular in England; and Browns are liked somewhat darker in the cock's hackles, and a darker partridge in the hens.

Judging Leghorns.

Little need be said about judging Leghorns. All real breeders, without exception, agree that many judges have laid too much stress upon mere size, and that there is urgent need for more attention to the distinctive Leghorn type, which is not so heavy as that of many birds exhibited. Many also have expressed regret that so much favour has been shown to large combs. There was a time when breeders themselves favoured these; but the fatal sterility thus caused, and widespread experience of the necessity for dubbing in consequence, has opened their eyes. Our opinion has been indicated; beyond that we cannot pronounce.

The Standards of the Poultry Club for Leghorns are as follow:

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Fine. *Beak:* Stout, the point clear of the front of the comb. *Comb:* (*a*) Single, or, in Blacks only, (*b*) rose; (*a*) of fine texture, large but not overgrown, perfectly straight and erect, deeply and evenly serrated, the spikes broadening at the base; extending well beyond the back of the head and following, without touching, the line of the hackle; free from thumb marks and side sprigs; (*b*) moderately large, firm, not overgrown so as to obstruct the sight, the leader extending straight out from the head, and not following the line of the hackle. *Face:* Smooth and of fine texture, and free from wrinkles or folds. *Wattles:* Long, thin, and of fine texture. *Ear-lobes:* Well developed and rather pendant, equally matched in size and shape, smooth, open, and free from folds.

Neck.—Long, and well furnished with hackle feathers.

Body.—Wedge-shaped, wide at the shoulders, and narrowing to the root of the tail. *Breast:* Round and prominent, the breast-bone straight. *Back:* Slightly rounded and sloping to the tail. *Wings:* Large, but tightly carried.

Tail.—Moderately full, carried at an angle of 40 to 45 degrees.

Legs and Feet.—*Legs:* Fairly long, the shanks free from feathers. *Toes:* Four, long, straight, and well spread.

Carriage.—Very alert and sprightly.

Weight.—6 lb. to 8 lb.

HEN

With the exception that the *Comb* in the single-combed varieties falls gracefully over to either side of the face, and the *Tail* is carried closely and not at such a high angle as the cock's, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—5 lb. to 7 lb.

COLOUR

THE BLACK

Beak: Yellow or horn. *Eyes:* Red. *Comb, Face, and Wattles:* Bright red. *Ear-lobes:* White or cream, the former preferred. *Legs and Feet:* Yellow or orange; toe-nails, yellow.

Plumage.—Rich blue-black, perfectly free from feathers of any other colour.

NOTE.—The Rose-combed Black is the same colour as the single-combed variety in all sections.

THE BLUE

Head points, Legs and Feet: As in the Black.

Plumage.—One even medium shade of blue from head to tail, a little darker blue allowed in the hackles and saddle of the cock, but the more even the colour the better.

THE BROWN

Beak, Eyes, Comb, Face, and Wattles: As in the Black. *Ear-lobes:* Pure opaque white, resembling white kid. *Legs and Feet:* Brilliant yellow, toe-nails to match beak.

Plumage of the Cock.—*Neck-hackle:* Rich orange red, striped with black, crimson red at the front of the hackle below the wattles. *Back and Shoulder-coverts:* Deep crimson red or maroon. *Wings:* Bow, same as back; coverts, steel blue, with green reflections forming a broad bar across the wing; primaries, brown; secondaries, deep bay on the outer web, which is all that appears when the wing is closed, and black on the inner web. *Saddle:* Rich orange red, with or without a few black stripes. *Breast and Under-parts:* Glossy black, quite free from brown splashes. *Tail:* Black, glossed with green; any white in tail is very objectionable. *Tail-coverts:* Black, edged with brown.

Plumage of the Hen.—*Hackle:* Rich golden yellow, broadly striped with black. *Breast:* Salmon red, running into maroon around the head and wattles, and ash grey at the thighs. *Body colour:* Rich brown, very closely and evenly pencilled with black, the feathers free from light shafts, and the wings free from any red tinge. *Tail:* Black, outer feathers pencilled with brown.

THE BUFF

Head Points and Legs: As in the Black. *Toe-nails:* White.

Plumage.—Any shade of buff from lemon to dark, at the one extreme avoiding washiness and at the other a red tinge, the colour to be perfectly uniform, allowing for greater lustre on the hackle and saddle feathers, and of the wing-bow in the case of the cock only.

THE CUCKOO

Head points, Legs and Feet : As in the Brown.

Plumage.—Light blue-grey ground, each feather barred across with bands of dark grey or blue, the markings to be uniform, and the colours shading into each other so that no distinct line or separation of the colours is perceptible.

THE DUCKWING

Head points, Legs and Feet : As in the Brown.

Plumage of the Gold Cock.—*Neck - hackle :* A rather light yellow or straw colour, a few shades deeper at the front below the wattles, the longer feathers striped with black. *Back :* Deep rich gold. *Saddle and Saddle-hackle :* Deep gold, shading in hackle to pale gold. *Shoulder-coverts :* Bright gold or orange, solid colour (an admixture of lighter feathers is very objectionable). *Wings :* Bow, the same as the shoulder-coverts ; coverts, metallic blue (blue violet), forming an even bar across the wing, which should be sharp, cleanly cut, and not too broad ; primaries, black, with white edging on the outer web ; secondaries, white outer web, which is all that is seen when the wing is closed, forming the wing-bay, black inner web and end of feather. *Breast :* Black, with green lustre. *Under-parts :* Black. *Tail :* Black, richly glossed with green, grey fluff at the base.

Plumage of the Gold Hen.—*Head :* Grey (a brown cap very objectionable). *Hackle :* White, each feather sharply striped with black or dark grey (a slight tinge of yellow in the ground colour admitted). *Breast and Under-colour :* Bright salmon red (this point is very important), darker on throat, and shaded off to ash grey or fawn colour on the under-parts. *Back, Wings, Sides, and Saddle :* Dark slate grey, finely pencilled with darker grey or black. *Tail :* Grey, slightly darker than the body colour, inside feathers a dull black or dark grey.

Plumage of the Silver Cock.—*Neck - hackle :* Silver white, the long feathers striped with black. *Back, Saddle, and Hackle :* Silver white. *Shoulders and Wing-bow :* Silver white, as solid as possible (any admixture of red or rusty feathers very objectionable). *Wings :* Coverts, metallic blue (blue violet), forming an even bar across the wing, which should be sharp, clearly cut, and not too broad ; primaries, black with white edging on outer part ; secondaries white outer edge, which is all that is visible when the wing is closed, forming the wing-bay, black inner web and end of feathers. *Thighs and Under-parts :* Black. *Tail :* Black, richly glossed with green, grey fluff at the base.

Plumage of the Silver Hen.—*Head :* Silver white. *Hackle :* Silver white, each feather sharply striped with black or dark grey. *Breast and Under-parts :* Light salmon or fawn, darker on throat and shaded off to ash grey on the under-parts. *Back, Wings, Sides, and Saddle :* Clear delicate silver grey or French grey, without any shade of red or brown, finely pencilled with dark grey or black (purity of colour very important). *Tail :* Grey, slightly darker than the body colour, with the inside feathers a dull black or dark grey.

THE PILE

Head points : As in the Brown. *Legs, Feet, and Toe-nails :* Yellow.

Plumage of the Cock.—*Neck - hackle :* Bright orange. *Back and Saddle :* Rich maroon. *Shoulders :* Dark red. *Wings :* Bows, dark red ; secondaries, dark chestnut outer web, which is all that is seen when the wing is closed, and white inner web. *Remainder of Plumage :* White.

Plumage of the Hen.—*Neck - hackle :* White, tinged with gold. *Breast :* Deep salmon red shading into white thighs. *Remainder of Plumage :* White.

THE WHITE

Head points, Legs and Feet : As in the Black.

Plumage.—Pure white, straw tinge to be avoided.

SCALE OF POINTS

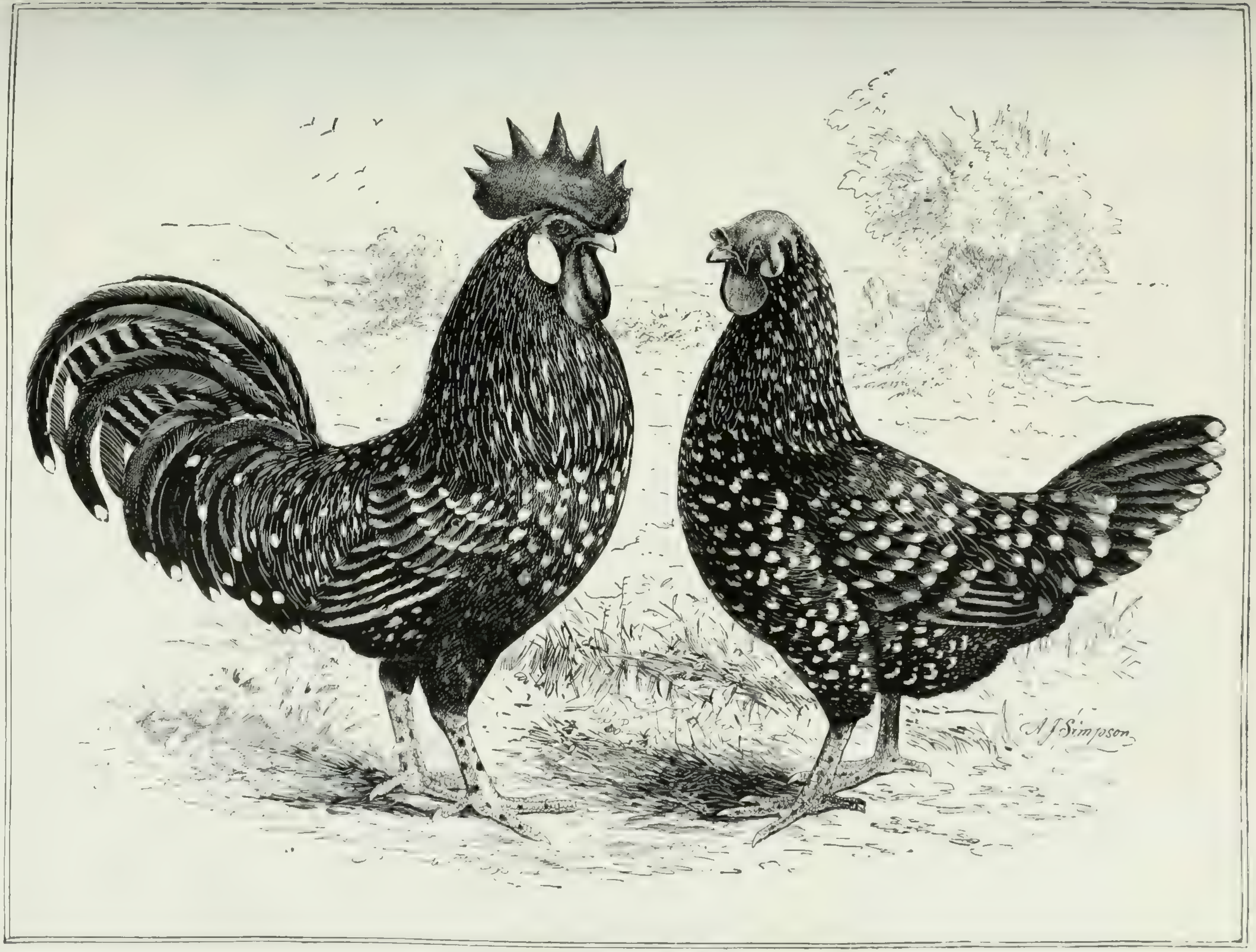
Colour	25
Ear-lobes	15
Size	15
Shape	15
Comb..	12
Condition	10
Legs	8
	100

Serious defects : Cock's comb twisted or falling to either side, or hen's erect ; red ear-lobes ; any white in face ; legs other than yellow or orange ; any bodily deformity ; and in Rose-combed Blacks, comb other than rose, or such as to obstruct the sight.

ANCONAS

Anconas.

One of the most popular additions to this group of fowls is known as the Ancona ; but there can be no doubt at all that it should be classed with the Leghorns, and is a variety of that family. The only distinction which could possibly be drawn, would lie in the characteristic activity and wildness of the original breed but that is shared fully by the Black Leghorn, which in all probability is one of the Ancona's ancestors, and all the "points" are in conformity with the Leghorn type. It is curious that from time to time several fowls have appeared under this name, but all showing a mixture of black and white blood. The earliest we remember (about 1864) were cuckoo-coloured, and dusky or leaden in the shanks. Unacquainted with the Leghorns, which arrived years later, we naturally put these birds down to probable crossing of black and white Minorcas, in harmony with what we knew of colour production : but there can be little doubt



ANCONAS.

now that they were really Cuckoo Leghorns or Anconas. They were at all events then called Anconas; and ten years or so later, we several times saw birds of the same type and called by the same name, but mottled or splashed with black and white like Houdans, instead of blue-barred—in fact like the present Anconas. In the light of these simple facts, few as they are, but which are within our personal knowledge, it seems clear that in the neighbourhood of Ancona there has been a general mixture—probably without any definite attempt at crossing—of a black Leghorn with white or light colours of the same family, whose results both in blue-barred and mottled plumage* have been so marked as to be given the local name. Should this be so, the extreme wildness of the Black Leghorn, noticed above, would account for the same characteristic in Anconas, and the Black Leghorn must be regarded as the real ancestor of this variety.

To such mixed ancestry may probably be attributed the extreme hardiness and prolificacy which distinguished the Ancona when first really taken up in this country. As a layer it was almost without a rival, quite a number of breeders reporting 200 eggs per annum; and its remarkable hardiness in regard to anything except foul air, or tainted ground, or extreme wet, was also soon observed. The breed at that time might be described as a Leghorn with plumage like that of a Houdan, or a rather irregular mottle of black and white in about equal quantities, and with black spots amongst the yellow of the shanks. A great many birds had coloured feathers here and there, but such feathers were gradually bred out.

This kind of bird is still bred by many on account of its laying qualities, under the name of the "old style" Ancona. For breeding it, all that is necessary, if the birds are of pure original Ancona strain, is to select a cockerel rather dark for exhibition and with dark under-fluff, and mate him with hens also rather dark, or not lighter than medium colour, by which is meant black and white in nearly equal proportions. The black in both sexes must be a glossy beetle-green black, and the black spots on the yellow of the shanks should be decided: head-points and ear-lobes must be selected as in other varieties. The following notes upon the character and qualities of this type of Ancona were kindly furnished by Mrs. Constance Bourlay, of Frankley Rectory, Birmingham, one of the earliest and largest breeders of the fowl, and who was largely instrumental in making its merits known in England.

"For many years we kept a few fowls after the usual fashion of ignorant people. The birds were expected to eat up house scraps, to lay a few eggs, and occasionally to appear at table. They often died; and no eggs were even hoped for in winter. Then we awoke to a sense of our own stupidity, and began to do better: but very early were obliged to recognise the importance of climatic conditions, and how much they were against us. Living on the top of a hill, 740 feet above the sea, exposed to every wind, particularly the north and east, with a heavy clay soil, which held all moisture, and winters that begin early and end late, one breed after another failed. Then by chance we bought a sitting of Anconas. They hatched well, grew wonderfully fast, and when winter came seemed indifferent to soil and climate, and laid eggs with the ground covered deeply with snow, and the thermometer far below freezing-point. At last we had found the right breed, and have never kept any others since.

"Light of weight, quick and very active, the Ancona is always on the move. If at liberty, they forage largely for themselves, ranging fields and the hedgerows from morning till evening, and keeping themselves warm with constant exercise. They do not sit about in corners, shivering in a north-east wind, but always seem busy and happy; and on many a winter day, with snow lying thickly on the ground, little paths have been swept for them to outlying manure-heaps in the fields, along which they scuttle with outspread wings and cheerful clucks, to spend hours in scratching, and then going back to their houses to lay, and returning in single file through the snow.

"They need to be kept dry, and should not be let out of their shelters in wet weather; but dry cold does not hurt them. The sleeping places should be very well ventilated, though free from draughts, and the birds should always breathe pure air, however cold the weather. This is very important to their health, and a stuffy, ill-ventilated house will soon produce roup and kindred diseases. Anconas need no coddling, and are far better without it. Fresh air day and night, good but moderate feeding, and protection from wet, is all they require; and with these they will lay steadily through the winter.

"A peculiar trait of the breed, and it must be acknowledged, a defect, is their extreme shyness and wildness. They are as wild as pheasants, and 'rocket' just like them; and it is also worth noticing that they have a distinct though delicate game flavour at table. If allowed, they will roost in trees as soon as they can fly, and in more than one instance have been only reached with a gun. They will, however, follow the person who feeds them, and last season I had a pullet that would pull my dress to be taken up, and always expected to eat her supper out of the feeding bowl as I went round the pens, but if I appeared in a different dress, or if a stranger was present, she would fly in terror. While being prepared for exhibition in training pens, they become perfectly tame, but a few days in the open makes them as wild as ever. It is not easy to account for this shyness, but it is a very marked characteristic of the real Ancona. They are also great flyers, and with some particularly timid strains it is well to cut a wing, or cover in the top of a run, when it is desired to keep them apart. The cocks are great fighters, and will continue their battles at every opportunity, till one gives in or is killed. They are also extremely polite to the hens, and at meals spend so much of their time in calling them and pointing out the daintiest morsels, that they very often get very little for themselves, and it is desirable during the breeding season to give them a good meal apart, to ensue their keeping in good condition.

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* It is highly probable that search in the same neighbourhood would discover blue-dun fowls, the other usual result of such mixture of colour.

"Ancona chickens grow with great rapidity, and are remarkably forward as compared with other breeds. They are hungry little birds, and require frequent feeding, but their independent habits make them very suitable for bringing up in foster-mothers. At seven weeks old the cockerels should be separated from the pullets. The latter frequently begin to lay at four months or five months old, but it is well to keep them back if possible until six months, when they settle down to steady egg-production until the moult in the following year. The moult is not a very serious business; sometimes, save for the freshness of the plumage, they show very little sign of what is going on; in other cases they will be very bare for awhile. It is to be noticed that they moult from dark to light, the feathers being lighter in the second year, and the brilliant yellow of the legs tending to fade in colour as they advance in age.

"As to when Anconas first appeared in England, we have no certain knowledge. Many of our best informed authorities remember birds of the name in the early 'fifties, and there is a theory that they were a cross between black and white Minorcas. If so, they could not have been of the present type, either as regards leg colour, shape, or hardiness of constitution. There is little doubt in my mind that they are a cross between the black Valdano of North Italy and the common barn-door fowl of that country, and an advertisement appeared in the *Cottage Gardener* of 1854 offering for sale a pen of Anconas which had won a prize at Birmingham, and had been imported direct from Italy. Though the black and white are the only variety known in this country, they may be found white, yellow and red in Italy, and golden-red feathers sometimes still appear in the hackles and tail coverts of the cockerels. The permanence of type is very marked, it being quite easy to trace the descendants of a particular hen through five or six generations, and among the many hundreds of chickens hatched we have never had 'a sport.'"

Writing in 1911, Mr. Thos. Layberry, hon. secretary of the Ancona Club, thus speaks of the breed:

"Many people, especially those who have only a casual acquaintance with Anconas, have said that the present standard has led to a great deal of crossing, in order to get size and the small tips on each feather which have taken the place of the ugly white splashes of the older birds. Much of this talk is purely imaginary. Reform of any kind is objectionable to certain people who call themselves fanciers, and, in order to try and stop any difference being made, charges are brought which cannot be substantiated. There may have been a few fanciers who resorted to crossing in order to obtain the desired result quickly, but to say that many adopted these tactics is most unjust to the Ancona fancy generally, and such statements have been one of the chief reasons for the cloud which has been over one of the best and most beautiful breeds of poultry for some years. It is only recently that they have emerged from this cloud, for it is well known if a lot of mud is thrown, some at any rate will stick.

"The merits of the Ancona are too many, however, to be permanently hidden, and the breed is once more becoming popular. In May, 1911, Mr. Warren, of Clondalkin, contributed to *The Feathered World* an analysis of the recent laying competitions, which plainly shows the Ancona to be as good as the best at winter laying. Why, then, do these croakers keep on saying that the breed has been spoilt?

"The only difference between the old and new Anconas is purely a matter of plumage and leg colour. Anyone who has access to poultry yards where the so-called old type Anconas are bred may see, amongst the soot and whitewash brigade, a few birds much darker than the rest. It was just these darker birds which caused the change. A few fanciers who were lovers of the beautiful saw at once what an improvement in appearance it would be if the dark birds could be obtained with the end of each feather tipped with white; so the very darkest (some few were quite black) were bred from until the desired result was obtained. The dark under-colour, 'so important in the exhibition bird,' caused a corresponding darkness in leg colour; but in some cases the legs were beautifully spotted with black, and these birds were again selected for breeding purposes. Another change also became popular, viz., the beetle-green sheen on the feathers. Most of the older birds had a purple sheen, but this was gradually eliminated, until to-day we have one of the most beautiful birds it is possible to wish for, and at no expense in the matter of type and size from the original Ancona.

New Type of Anconas.

"And now about the laying qualities! Some of the grumblers said it would be impossible to retain the utility qualities if so much was made of the colour question. Yet we have White Wyandottes, Leghorns, Rocks, Orpingtons, etc., and we also have the same varieties in blacks, each and every one of which, if we get the right strains, are good layers, so that there is plain proof that colour has nothing to do with utility qualities at all.

"The real points to be observed for utility qualities are type and strain. We have not altered the type at all, as will be seen from the standard; and as to strain, the average modern Ancona will lay from 150 to 190 eggs yearly, which is, to say the least, as good as any other breed. Most of the egg averages of twenty years ago were mere guess-work; to-day we use trap nests."

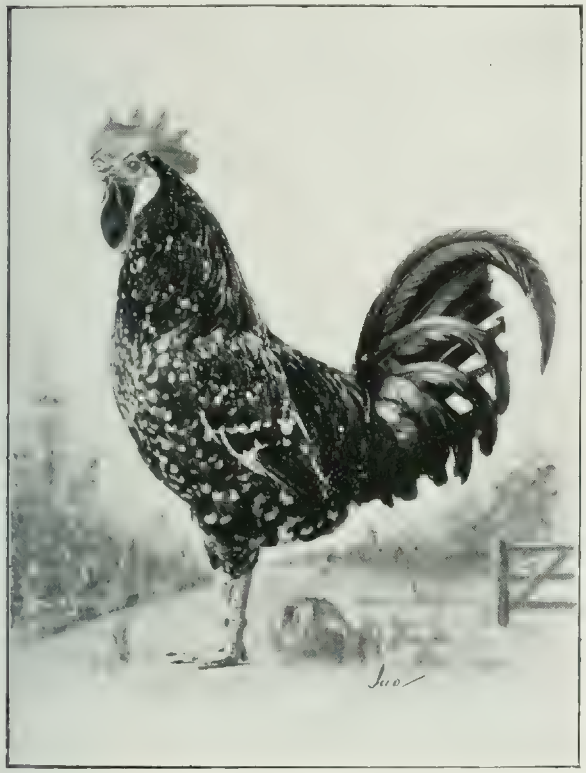
The following notes on the exhibition type of Ancona are furnished by Messrs. Heap Brothers, of Worsthorne, near Burnley, well known as successful exhibitors.

"This breed, it is generally conceded, was imported into this country from Ancona in Italy, where it has been kept in large numbers by the farmers of that district for its utilitarian properties. Certainly it ranks as one of, if not the very best layers extant. We have frequently heard Anconas decried as layers of small eggs, but as with most breeds, we consider this to be more a matter of strain. The strain that we keep lay eggs which average over 2 ozs. in weight, which we consider quite up to, if not above the average. As we have said before, they were imported into this country for their exceptional laying qualities, and the reception they met with has scarcely been equalled by that of any breed in recent years. They are indeed very profitable fowls from a utility point of view, as they mature very quickly, pullets very often commencing to lay when about eighteen weeks old. The cockerels are also very precocious youngsters, crowing frequently at five or six weeks old. As table fowls they can scarcely be recommended on account of their smallness, but their flesh is excellent in flavour.

"It was not long before they made their appearance in the exhibition pen. About the year 1898 a difference of opinion arose amongst Ancona breeders as to the type of bird which should constitute the standard, and at a meeting held at the Dairy Show in 1899, which was well attended by the principal breeders, a standard was drawn up and passed as a guidance to breeders what to breed for. This standard met with much opposition at the time, and was the subject of much controversy in the poultry papers. The question finally resolved itself into how large or how small the tipping at the end of each feather should be, also the way the feathers should be tipped. We favoured, as we do still, the small V-shaped tip. Were they tipped or mottled—call it what you like—to the extent of three-eighths of an inch, as some breeders contended, on each feather, the bird would present almost the appearance of a white one, as the ground-colour would be covered by the feathers overlapping each other. The Anconas often seen at exhibitions a few years ago were frequently held up to ridicule for their mongrel appearance, and it was with a sincere desire to improve this splendid utility fowl from an artistic or exhibition standpoint, and to breed them more uniform in colour and shape, that the present standard was evolved.

"We know of no breed that has made more rapid strides in the time towards attaining that end than have Anconas. When we consider the progress made in breeding since the present standard was made, the success achieved has been remarkable, though certainly there is still much room for improvement. In cocks, a few years ago one scarcely saw anything but white tails, tipped with black, which were certainly not uniform with the body colour. Our aim is to breed them with a good beetle-green ground-colour, with each feather tipped with white, throughout the entire bird.

"In mating Anconas to produce exhibition birds, one needs to be very careful in the selection of stock birds. Examine each bird carefully, and discard any that have white under-colour. This is a very common fault, and one that breeders should take pains to exterminate. Another evil to be avoided is lacing, by which we mean a white edging round the feather. Choose those with (as nearly as you have them) the **V**-shaped tip, with the white clearly distinct from the ground-colour, which gives the bird a slaty appearance. Select for the male bird one with firm erect comb, evenly serrated, serrations deeply cut, face a brilliant red, white face in Anconas being a disqualification and not merely a defect; lobes medium in size, almond shape, and white; body colour as nearly to the exhibition standard as possible; legs deep yellow with black mottling evenly distributed. Be careful about the tail. Examine the bird and see that the feathers are black from the skin; many begin white, then are black in the middle of the feather, then white tip at the end. In hens, again, be careful about selecting those with sound under-colour, and in colour we like them rather on the dark side: we mean darker in appearance than required for exhibition. A frequent fault in Anconas is that they carry their tails too high, squirrel fashion; try by all means to breed this out by selecting only those with low tail carriage.



Ancona Cockerel.

"It may seem that there are many points to avoid, and so there are; but if one wishes to produce really good exhibition specimens, it is much better to breed from two hens and a cock which have the qualifications to breed standard birds, than a field full of so-called Anconas of the old, 'splashed-anywhere-you-like birds,' which gave one the impression that they had been splashed with a white-washer's brush.

"Another point in favour of the new standard is that cockerels and pullets may be bred from the same pen, as the colour of both is identical in every respect, with the usual sexual differences. This is much in its favour. We think the reason for the apparent decline in many breeds, such as the Hamburghs, is mainly that two pens are required, one for breeding cockerels and another for pullets, many working-men fanciers not having accommodation for what becomes practically two breeds. Of course, there are birds naturally better adapted for cockerel or pullet breeding, such as a hen with an erect comb, which (had she other requirements) might be valuable as a stock bird, though not for exhibition purposes."

The two photographs herewith of Mr. Eadson's winning 1910 cockerel and Mr. Whittaker's pullet show the progress made in exhibition specimens.

Rosecomb Anconas.

About 1902 a Rosecomb Ancona came upon the scene, but, owing to the difficulty of breeding birds of Ancona type with helmet combs, they have not made that headway which they were expected to do. Still, there are several fanciers who still stick to Rosecombs, and the Club Show of 1911 will, we think, mark a distinct advance in this variety. Many of the Rosecomb pullets lay quite a brown egg.

The Standard of the Poultry Club for Anconas is as follows:—

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Moderately long and deep, and inclined to width. *Beak:* Of medium length and with a moderate curve. *Eyes:* Prominent. *Comb:* (*a*) Single or (*b*) rose; (*a*) of medium size, upright, with deep serrations (broad at their base), and five to seven spikes, the outline forming a regular convex curve, carried well back, and following the line of the head, free from excrescences (or thumb marks or side spikes); (*b*) of medium size, low and square at front, and tapering towards the leader (which should follow the curve of the neck), the top free from hollows and covered with small coral-like points of even height. *Face:* Smooth. *Ear-lobes:* Of medium size, inclined to almond shape, and of kid-like texture. *Wattles:* Size in keeping with the comb, long, and of fine texture.

Neck.—Long and well covered with hackle feathers.

Body.—Of medium length; broad shoulders and narrow saddle; full and rounded breast carried upwards; large wings well tucked up.

Tail.—Large and carried well out.

Legs and Feet.—*Legs:* Of medium length, set well apart, the thighs almost hidden by the body feathering, and the shanks and feet quite free from feathers. *Toes:* Four, rather thin, and well spread.

Carriage.—Active.

Weight.—From 6 lb. to 7 lb.

HEN

With the exception of the single *Comb*, which falls over one side of the face, preferably in a single fold, and partly hiding the face, the general characteristics are similar to those of the cock, allowing for the natural sexual differences.

Weight.—From 5 lb. to 6 lb.

COLOUR

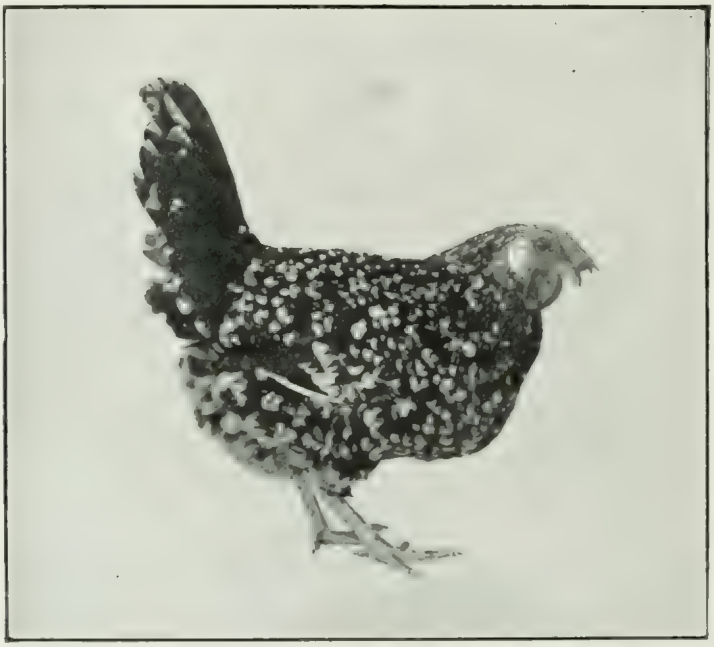
Beak: Yellow, with dark or horn shadings, but preferably not wholly yellow. *Eyes:* Iris, orange red; pupil, hazel. *Comb, Face, and Wattles:* Bright red. *Ear-lobes:* White. *Legs and Feet:* Yellow, mottled.

Plumage.—White markings (free from ticks) on beetle-green ground, the more evenly V-mottled with white the better, but mottled and not laced. *Tail:* Black to the roots and tipped with white. *Wing Flights:* Black tipped with white. *Under-colour:* Black.

SCALE OF POINTS

Beetle-green ground colour, dark to skin ..	25
Purity of white, quality and evenness of mottling	25
Tail	15
Comb	10
Legs and beak	10
Eyes	5
Lobes	5
Condition	5
	100

Serious defects: White in face; plumage other than black and white; white or light under-colour; other than four toes; wry tail or other deformity.



Ancona Pullet. (The property of Mr. Thos. Whittaker, a frequent winner.)

CHAPTER XXIX.

HAMBURGHS AND REDCAPS.

UNDER the general name of Hamburghs are now grouped a class of fowls which formerly were known under different names, but which share the common characteristics of rather small size, rose-combs, more or less white and round ear-lobes, slender, dark, clean legs, absence of the incubating instinct, and full sweeping tails. Looking at all that is really known of their origin, that of the spotted or Spangled, and of the barred or Pencilled varieties, appears quite distinct; the Pencilled Hamburghs having undoubtedly reached England from Holland under the name of Dutch Everyday Layers, and being also known as Chittiprats and Creels; while the Spangled Hamburghs emerged from Yorkshire and Lancashire, where they had been bred for years, from what stock no man knows, under the names of Mooneys and Pheasant fowls; the former from the round moon-like spangles, and the latter from the resemblance to pheasant-marking of their more crescentic spangles.

Yet while the Pencilled and the Spangled have thus been distinct to many generations of breeders, no one can look at them even to-day without being struck by the idea of some common origin; and for such a belief there is strong evidence in chickens and old birds. Spangled chickens are often, and used to be always, *pencilled* in their chicken feathers; and when old, the black spangles are very frequently surmounted by a light tip beyond them, thus returning slightly to a somewhat pencilled character. On the other hand, if Pencilled Hamburghs are bred too dark, the final bar often becomes too wide, thus approaching in some degree the character of a spangle; and in 1853 *The Poultry Book* makes the significant statement respecting Pencilled Hamburghs, that "*Spangled* feathers mixed with the pencilled are very objectionable." We have, therefore, in Hamburghs several real *breeds* and not mere varieties of fowls, of long distinct breeding, yet probably of some one more remote single origin, of which they still bear traces. What that remote origin may have been, it is not so easy to say. The old writer Aldrovandus figures a fowl with a fairly strong general resemblance to the Pencilled Hamburgh, and calls it *Gallina Turcica*, or the Turkish fowl; and the apparently westward drift of all original breeds may suggest as possible that some such original race may have thence come to Holland, and so on to England; but such speculations cannot be further entered into here.

In their different varieties of barring, pencilling, and spangling, the gorgeous lustre of the Blacks, and the matchless symmetry of all varieties, Hamburghs are confessedly the most beautiful of poultry. The "fancier" of any other breed has also his "points," about which he is, of course, quite as enthusiastic, but which the man in the street very often cannot understand or admire: no eye needs any education to rest with delight upon the subjects of this chapter. In beauty, seen and understood of all, none dispute their place.

Qualities of Hamburghs.

In suitable circumstances they are also most profitable fowls, being quite small eaters, but most prolific layers, except perhaps the Golden Spangled, which vary much: the cock-breeding strains of these also are often good layers, but the pullet-breeders or Golden Mooneys are usually very poor indeed. The Silver Spangled, Pencilled breeds, and Blacks, have often been recorded as laying 200 to 220 eggs in a year, those of the Pencils being, however, decidedly small. These good qualities come out best upon a free range, where Hamburghs will to a large extent keep themselves, foraging all over the ground early in the morning for worms and insects, on which they depend largely for their great productiveness. They are as a rule non-sitters; but the rule is not universal, as all the varieties have been known, when at liberty, to occasionally steal a nest and hatch chickens, though we never heard of a case when kept in confinement. Such occurrences are no sign at all of impurity of blood. Finally, the flesh is tender and delicate, though the birds are small—Silver Mooney cockerels are not so very small—and hence always acceptable upon the table.

When free range is thus at command, these birds do best on the natural open-air plan, roosting at night in sheds entirely open, or even in trees, which hardens them just as Mr. Teebay found with his Spanish. Thus treated,

General Management.

when once past chickenhood they will be found hardy: the Pencilled breeds being most delicate, and specially subject to roup if cooped up in small runs and houses, for which they are not adapted. Black and Silver-spangled Hamburghs have, however, been kept with success in moderate-sized and even small runs, provided they are kept scrupulously clean, and roost in the open kind of houses described on page 18 of this work. When so kept, of course, their laying qualities must be maintained by animal food, in lieu of the insects they would procure in the fields.

The eggs of full-feathered Hamburghs are very fertile as a rule, and the chickens active and easy to rear, if reasonably cared for. Owing to their small size, they should at first have small seeds like millet and canary in good proportion, which also help them to feather well; and their crops being small, unless at large they should be fed little and often. Nearly all Hamburgh breeders, especially of Pencils, would like their birds bigger if they could get them so without loss of quality; and we know from results with other small fowls, that much more might be done towards this than is generally supposed, by the use of ground oats and finely-cut bone, diminishing the latter as the combs grow. They must be kept clean, and dry underfoot; and if with hens, require great watchfulness against insect vermin; not that they are specially liable to this, but that they suffer from it in proportion to their smaller size. They come to maturity pretty early, and will often lay at five months old, Pencils usually being the earliest, and Golden Spangles the last. If space is in the least limited, weeding out of obvious wasters, and of surplus birds of the wrong sex, should be done at the earliest possible time, to make room, the purest possible air and ground being all-important.

Hamburghs are seldom used for crossing purposes; but it is worth mentioning that the cross between a Silver-spangled cock and Light Brahma hens often produces chickens of great beauty, fairly well spangled. In these days, when lacing has been extended from Sebright and Polish to the larger-sized Wyandottes, and these spangled breeds themselves have been already Bantamised, it might be found worth while to extend such beautiful marking to a larger race.

Till the exhibition era, knowledge of the Spangled and Black Hamburghs was practically confined to Lancashire and Yorkshire, but the Pencilled were known as Everlasting Layers, in London and elsewhere, from quite an early date. When the Spangles first became more widely known they excited great admiration; but owing to the system of breeding not being understood—double-mating was generally unknown then, being in fact almost confined to this breed—the produce of purchased stock was so disheartening, and it was so impossible to win against the northern breeders, that many gave them up again in despair. A similar system has since been extended to the Pencilled breeds; and while the perfection to which it has been brought has resulted in a beauty and accuracy of marking not previously attained, and unequalled in any other breed of poultry, there is probably no other example so impressive of the depressing effect of a rigid double-mating system upon the *general* prevalence and popularity of a fowl, whose singular beauty and productiveness would otherwise have certainly marked it out for very wide cultivation.

The breeding of Hamburghs for exhibition altered even within Mr. Wright's recollection. That recollection extended perfectly (with the aid of notes respecting fresh developments) for thirty years, and in less degree for forty years. Even the full account written by the late Mr. Henry Beldon for the first edition of *The Illustrated Book of Poultry*, required considerable revision by himself for subsequent editions; and further changes in breeding have since taken place. He had left us a few memoranda regarding some of these; but his death some years ago—keenly regretted by all true lovers of the Hamburgh—had made it impossible that the following articles should proceed directly from his pen. In these circumstances the late Mr. Henry Pickles, of Earby, Colne, came to Mr. Wright's assistance, but expressly desiring not to interfere more than necessary with the views of his late friend, and one so highly respected among all Hamburgh breeders. He therefore made detailed notes and additions where necessary, answered many queries arising out of these, and supplied feathers to illustrate modern changes. Mr. William Roberts, of Ingol, Preston, also kindly gave some occasional aid in both these ways. While express quotation is impossible, the greater part being necessarily collated and put into shape by Mr. Wright, it will therefore be understood that the articles on breeding the Spangled and Pencilled varieties of Hamburghs are in substance due to the late Mr. Beldon; where necessary, corrected or added to by Mr. H. Pickles, with occasional aid also from Mr. W. Roberts, and the whole finally revised by both these eminent breeders.

Silver Spangled Hamburghs.

The comb of an exhibition Silver-spangled cock should be even, firmly set on the head, long, and moderately broad, full of "work" or points, free from hollow in the centre, and ending in a long spike slightly pointing upwards. The beak should be horn colour, ear-lobes a clear white, smooth, and as nearly round as possible; face red, quite free from white; and eyes a dark hazel or red; legs a slaty blue. The neck should be nicely arched, with very full hackle falling well on to the shoulders; the breast full, broad, and prominent; back a moderate length, broad and level across, not round or up at one side; tail full, the sickles long and gracefully carried. Formerly the tail was liked rather high, though not squirrel-fashion, but is now preferred carried well back, as are all Hamburghs. The whole carriage should be graceful, jaunty, and cheerful. In regard to the plumage, the ground-colour should be pure silvery-white, quite free from straw or yellow, though at the end of the season, if exposed to the weather and sun, many good birds will turn rather yellowish. The head and hackle were formerly white; but the hackles and saddle feathers are now bred with black tips, the centres of which are dagger-shaped, while the fringe of the hackle extends the spot almost into a diamond. The saddle-hackles are the same, more heavily tipped, and the back is more heavily spotted still. Fig. 122 represents a saddle and hackle feather properly ticked. Sometimes birds otherwise good will have hackles and shoulders a little rusty or yellow: this is a great fault, of a worse kind than the slight tendency to straw which may be apparent in a good bird that has run long at large in the sun. The breast and thighs should be evenly spangled with round spangles, of a rich, satiny green-black, as large as possible so that they show the white; white throat or black thighs are the most usual faults here. The spangles which form the wing-bars must be especially even and distinct, as also those on the ends of the secondaries, which form the so-called "steppings" of the wings. Shoulders and wing-bows have dagger-shaped spots somewhat like the saddle-feathers, but shorter and broader. Each feather of the true tail and also of the sickles and side feathers, should be white with a large spangle at the end, those of the true tail being more of a half-moon shape.

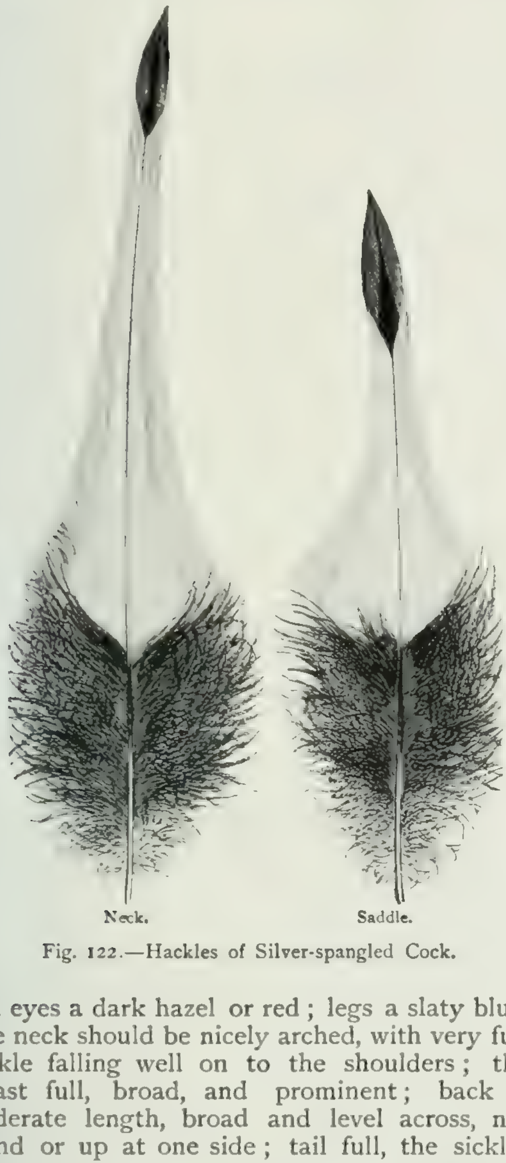


Fig. 122.—Hackles of Silver-spangled Cock.

Ideally the hen should correspond with the cock, with head-points in proportion, and white ear-lobes; but this is still an ideal, the combination of good lobes and perfect spangling being still an achievement for the breeders of the future. The spangles should be of an extremely rich and satiny green-black, looking almost as if raised or embossed, and the back should be rather broad, so as to give room for them to show well. The breast must be spangled from the throat right round to the fluff, good distinct bars on the wings, and the tail clear, with a spangle at end of each feather. The spangles should be as large as possible, so long as there is white enough to distinguish them. The marking on head and neck has gone through a series of remarkable changes, owing to which the most successful winners of the present day are neither as formerly, nor as described in the Standard. When Mr. Beldon wrote in 1870, the neck of a good exhibition hen was really *spangled* from top to bottom, as in Fig. 123, exactly drawn from feathers of a noted cup winner; even close to the head, it will be seen, there were very fair spangles. The Standard in 1900 described the hackles as "tipped from the head with dagger-shaped tips, becoming spangles at the shoulders." Except at the shoulders they are neither of these in the majority of cases, Fig. 124 representing feathers in the same places as those shown above from Mr. Beldon's cup hen, from cup-winners belonging to both Mr. Pickles and Mr. Roberts. Up to about half-way down, it will be seen, these feathers are *striped*, the full half-way feather beginning, however, to show the stripe coming to an end near the base, and with a tendency for the white ground also to break into the feather more towards the tip. This change to striping is a consequence of the changes in breeding to be described.

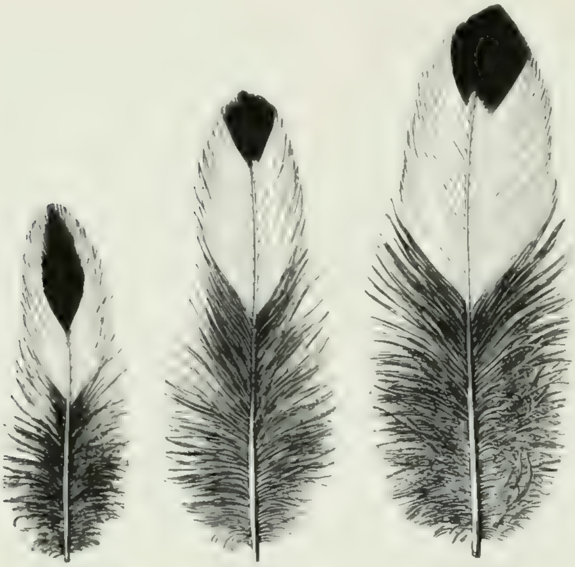

Near Head.
Half-way.
At Shoulder.

Fig. 123.—Hackles of Silver-spangled Hen, 1870.

Breeding Silver Spangles.

The Silver-spangled Hamburgh owes everything to the counties of Lancashire and Yorkshire. In Lancashire hens had been brought to a very high standard years before ever poultry-shows were thought of, and as regards feather, all our modern skill has been unable to improve upon this old breed ; indeed, some of the old Mooneys, as they were called, were absolute perfection in this point of feather ; the spangling, so large, round, and rich in colour, was really something to be wondered at. This careful and extreme breeding for feather in the old Lancashire Mooney fowls, resulted in producing hen-feathered cocks — that is, cocks marked very similarly to the hens, heavily ticked on the neck, with spangling on the back, sides, etc., and with a square or hen tail. It was to this variety that all the prizes were given at the beginning of the poultry-showing era ; but after they had enjoyed a year or two's popularity, the judges at Birmingham announced that the hen-feathering of Mooney cocks was not the "correct thing," and that such birds were unfertile. In this latter charge there was much truth in regard to many, though some are prolific enough ; but the hen-tailed cocks were thrown out, and their reign as show birds was over.

In Yorkshire, on the other hand, was another Silver-spangled breed known as the Yorkshire Pheasant, which had the desired cock-feathering, the cock being a fine full-plumaged bird ; but the spangling was much inferior to that of the Lancashire variety, lacking not only in size, but the roundness and glossy greenness of the spangles ; but being decidedly smarter in appearance, and possessing whiter ear-lobes. The hen-feathered Lancashire Mooney had coarse, red ear-lobes, and even the older Yorkshire Pheasants had not much to boast of in this respect ; still they were whitish, and a few years' careful breeding soon brought this point to perfection. The Yorkshire cocks had, moreover, nice clear tails, while the hen-feathered cocks of that day often had smutty tails ; but the Yorkshire birds lacked colour on the back and wings. Still, at first these Yorkshire cocks were shown with Lancashire

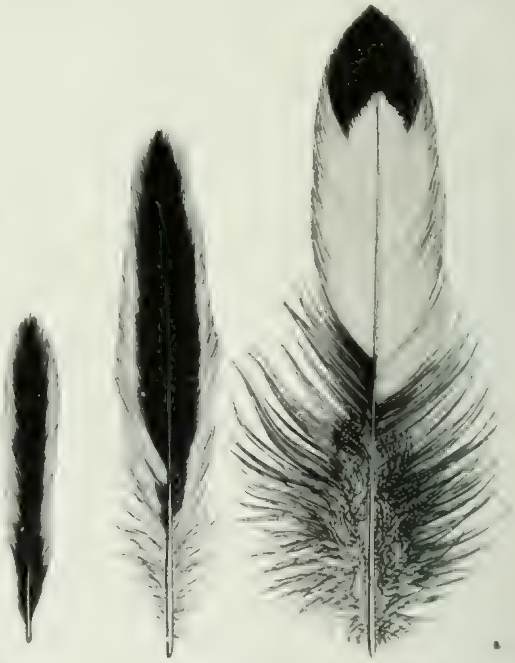

Near Head.
Half-way.
At Shoulder.

Fig. 124.—Hackles of Silver-spangled Hen, 1900.

Mooney hens, and of course the two varieties had to be kept and bred separately.

Each variety however possessed great defects: in the Mooney hens the combs were coarse and the ear-lobes red; while in the Yorkshire cocks the neck, back, saddle-hackles, and shoulders were almost white, and the breast-marking very poor in comparison. The next step was to cross Mooney cocks with Yorkshire hens, which produced cockerels with fairly clear spangled tails, smarter combs, and white ear-lobes, yet with better spangling. This system lasted many years, but by degrees the repeated crossing produced a great deal of really amalgamated blood, and the pure old Yorkshire Pheasant practically disappeared, while a considerable portion of Yorkshire blood crept into many, if not most, of the Mooney strains. When Mr. Beldon wrote in 1870, this had gone so far, that the system he himself practised and recommended was to select an exhibition cockerel with as much marking on back and saddle as possible (never found in the old Yorkshire Pheasant pure) and put him with hens heavily spangled, but with good combs and ear-lobes. Blood was so mixed at that period, that much mating was very speculative: the male show bird, as deep in colour as possible, was to be mated with the best hens obtainable, and the result awaited. If good, the breeder kept that pen as long as it would breed: if disappointing, he tried another cock. A pen would often breed good cockerels but only middling pullets: because although good marking had been obtained on the back and saddle of the exhibition cock, superseding the white of the old Yorkshire, his neck-hackle was still demanded white, which was bad for pullet-breeding; hence, hens were in practice bred chiefly from pens containing more Mooney blood, though their breeding was perhaps not exactly known.

Mr. Beldon's opinion at that time, often expressed to us, was that the amalgamation was likely to go further still, and produce yet deeper colour in the cocks, until only one male would be generally required, which might however probably breed the best pullets from the females with most Mooney blood. One of these anticipations was fulfilled; the exhibition cock having now finer and better spangles, the hackle being well ticked, and the saddle more heavily than before, so far making the bird a better pullet-breeder. Yet curiously enough, the practice of breeding Mooneys from the hen-tailed cocks for pullets, has not only held its ground (the oldest breeders never having abandoned it), but the supposed pure Mooney is more bred than ever. The breeder now seeks for his cockerel-breeding pen an exhibition bird of pure white colour, heavily ticked in hackles, and well spangled, and with special regard to good comb and ear-lobes; and mates him with hens bred from the same cock-breeding strain, and so heavily spangled (*i.e.* in their natural state) as to be almost black-breasted. These hens are specially selected in regard to neat heads and good ear-lobes. For pullets, on the other hand, Mooneys, or the birds so-called, are chosen on both sides. Both sexes in these Mooneys are very large, much larger than the cock-breeding strains, but coarse in heads and combs, and more or less red in ear-lobes: these faults are tolerated for the sake of the spangling, which is glossy green. The hen is naturally very much darker than she is exhibited (see page 235) and as a rule the darker ones breed the best stock: they must be spangled up to the throat and not go off white just under it.

This is the present and general method of breeding, but not quite universal, and Mr. C. Holt * advised mating a heavily-marked exhibition cock with two cock-breeding and two Mooney hens, with a view to breeding both sexes. He was a great deal criticised for this advice, and it was not altogether a valid reply to state that with a pullet produced by such a cock and a crack Mooney hen he had beaten all the old Hamburgh breeders at Silsden, since that was in 1884, and breeding has perceptibly changed even since then: still the coincidence of the advice and experience with Mr. Beldon's should have some weight.

The question is not really so simple as some suppose, and will be best considered in connection with that of the spangling itself. The old Lancashire breeders sought as large and as round spangles as possible, and got them so large at last that the birds literally *could* not be shown without extensive thinning out, as was understood by all, and never then objected to. There has been some little reaction against that, and the present Standard qualifies it by the words, "never so large as to overlap," but this is more nominal than real, and birds have to be thinned out still. There is, however, some perceptible change, as will be seen by comparing A in Fig. 125, drawn from one of Mr. Beldon's feathers (from the back) in 1870, with B, from the same part of one of the "crack" hens of 1900. The spangle is perceptibly smaller, though probably (owing to greater proportion of Mooney blood) from a larger bird. Nothing has therefore been gained, as many suppose, in size of spangling by going back more to the Mooney, while the ear-lobes have lost considerably. As already observed,

Hamburgh Spangling.

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* "Hamburghs Up-to-date": *Feathered World* Office.

really good spangling had also been obtained in the hen's hackle in 1870 (Fig. 123), while the Mooney revival has brought back mere striping more than half-way down (Fig. 123), which is a mark of the old Mooney breed, but as regards spangling is retrograde.

But more than these points are involved. First from the fancier's point of view, must be mentioned *greenness* of the spangles: in this the old Mooney was far superior, and probably its matchless green lustre had most to do with the revival. In the second place, Mooneys are far *larger*, and lay much larger eggs than the cock-breeding strain. The birds will average $1\frac{1}{2}$ lbs. to 2 lbs. heavier, and the eggs weigh about eight to the pound. These points affect the Hamburgh closely as a useful farmer's fowl, small size of eggs being a great drawback from a utility point of view. It was no doubt these points which captivated Hamburgh breeders: size of spangles had nothing to do with it, since in that nothing has been gained, while some points have been appreciably lost.

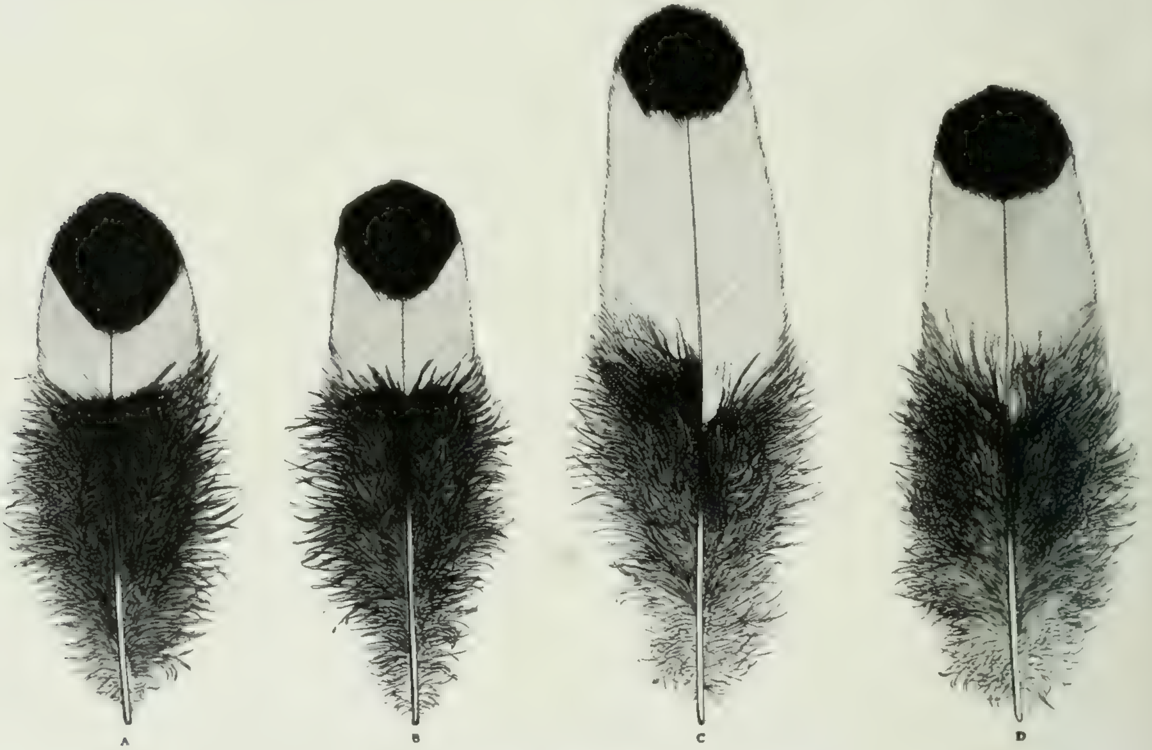

Fig. 125.—Feathers of Silver-spangled Hamburghs.

There are also some differences in regard to the *shape* of the spangles. The desire to get spangling more clearly apart on the bird without thinning, or with less of it, has not only led to perhaps slightly smaller spangles, and probably even had some effect in preference for the bigger bird, which gives more space to spread them over, but led to a desire for *shorter* spangles. Formerly, though approximately round, these came nearly to a point at the bottom (A, Fig. 125), though often rounded there, as in the modern feather B. But there has been lately a tendency to cut off more and more of this bottom corner, either as in C by a roughly straight line, or by contracting the approximate circle into an approximate oval, as in D. Each of these feathers is from a cup-winner, and it will be seen that such shortening of the spangle enables a larger spot to appear distinct, than when it is a full circle, or fully pointed. So marked is this movement that some of the best breeders rather seek for what they call a "half-moon" spangle, *i.e.* one with a flat or straight base. A distinctly flattened base from a very well-known hen is shown in E, Fig. 126; and in F is almost a half-moon, the nearest which Mr. Pickles could find. This is from the stepping of the wing: but he writes that he would delight to see a bird with every feather more or less like it. But here too opinion is not unanimous. Some still prefer the pointed spangle, and the extreme of such a tendency is seen in the "pear-shaped" spangle (G, Fig. 126). The pointed kind of spangle is at present the favourite in America, and a great many English birds are selected to go to America for this reason, both hemispheres being thus suited. In America the spangling is however mostly smaller than in England, and the effect of the pear-shape in making the bird look much blacker for the size of spangle, can be seen at a glance. Before leaving the subject of spangles it will be interesting also to give (H, Fig. 126) a feather of the more crescentic spangling which formerly marked the old Yorkshire Pheasant, but is now rarely to be found, that old breed having practically disappeared.

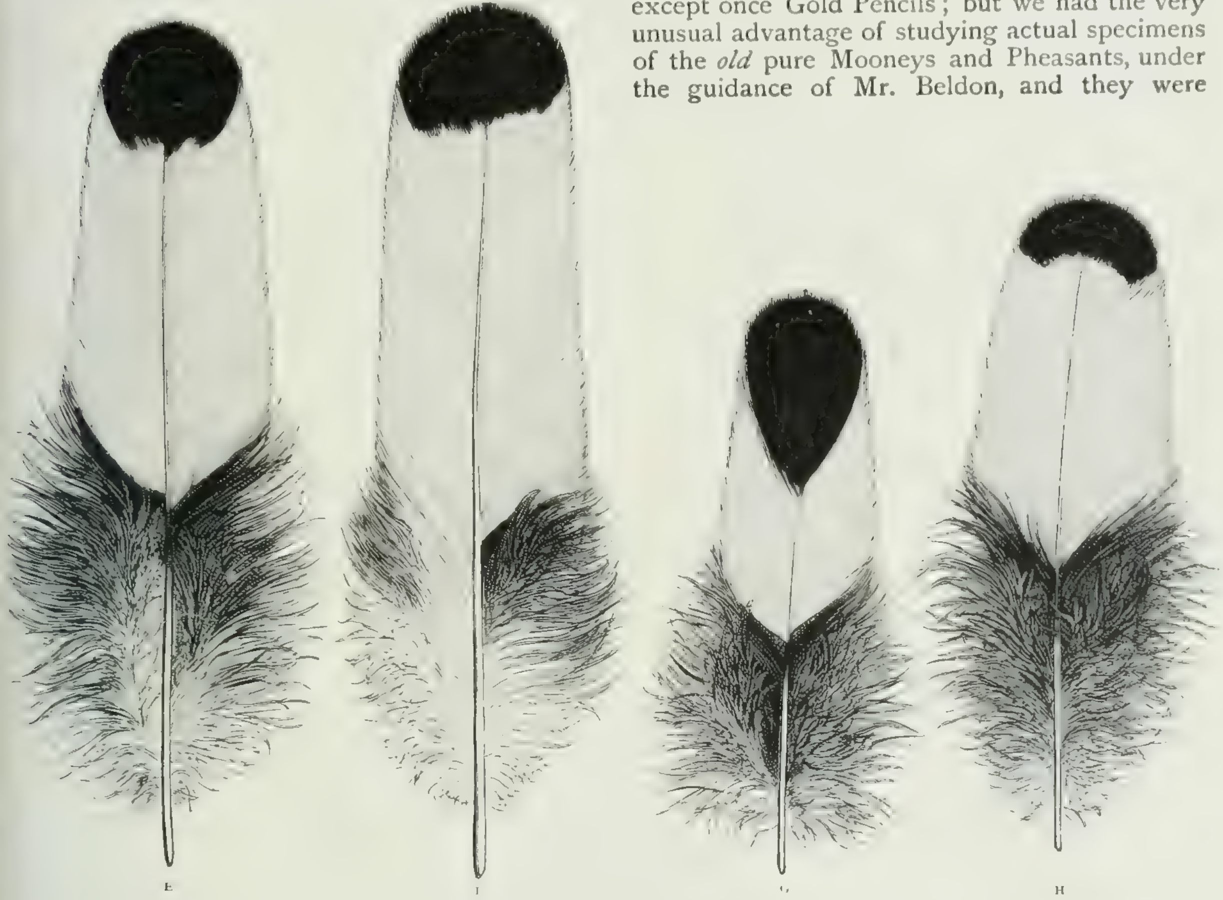

Fig. 126.—Feathers of Silver-spangled Hamburghs.

This leads finally to a few words about the amount of distinctness between cock-breeding strains and the "pure" Mooneys as now bred. Distinctness of strain there is; of *breed* there is not so much as many suppose. A well-known exhibitor and judge wrote in 1898 that he had bred cocks for years, and "never had the slightest touch of Mooney in his birds"; and of any modern crossing this was no doubt correct. But every spot in the hackle and saddle and back, and the roundness of every spangle, in every one of his winners, came from the Mooney alone; as did every trace of black fluff at the base of any of the feathers. Conversely, the same may be said of the supposed "pure" Mooney. We never bred any Hamburghs, except once Gold Pencils; but we had the very unusual advantage of studying actual specimens of the *old* pure Mooneys and Pheasants, under the guidance of Mr. Beldon, and they were different from the present. In the year 1873 he wrote to us as follows:

> Nearly all the so-called pure Mooneys now have white ear-lobes, showing they have been modified by breeding. Hen-feathering is no sign of absolutely pure blood, being very easily produced. In Yorkshire also, though I live there, I should have some difficulty now in finding a pure-bred Pheasant, our Mooney hens having a dash of the Pheasant, and our so-called Pheasants a *lot* of the Mooney. At the last Birmingham Show (1872) there was not one *absolutely* pure Mooney hen, though there were some splendid birds. Some ten or twelve years ago I came into possession of a lot of Silver Mooney hens, the really pure old stamp, picked up from all parts of Lancashire by old Jack

Andrews. These hens were much larger than those we have at present, and were certainly coarse; but for spangling—it was perfection! Still, I think among the amalgamated strains we have as good, and that moult as true. I inquired of old Jack, a very short time ago, if he thought any of this "old sort" could be found still; he said he had looked the whole county through, but could find none.

The old breed was not so extinct as Mr. Beldon supposed, and has undoubtedly come more largely again into the pullet strains of to-day, as shown by the coarser ear-lobes and greater size. But still there are differences. The old Mooney hens had *striped* hackles; and while this has partly come back, the spangled shoulder-hackle still remains from the mixed blood (Figs. 123 and 124). Pullets still often appear with white ear-lobes, though considered "pure"; the old Mooney *never* bred such a lobe, which is another sign of "amalgamated" blood. Thirdly, the intense black fluff of the old Mooney hens is by no means so dark now. Fourthly, the old Mooney cock was much smaller in proportion to the hen, than to-day. And finally, the old Mooneys had dark tail-feathers, especially on the inside; and these in most winners are much clearer now.

On the whole, in the interests of this noble breed it is to be wished that some movement should be made, quite apart from any question of single mating. The Mooney blood (as it is now) possesses size, and magnificent colour, and moults true year after year; while the heads and lobes, though still coarse, are less so than formerly. It seems a pity there cannot be revived classes for Mooney cocks: with these also to breed for exhibition, as remarked some years ago by Mr. J. Roberts, head-points would soon improve. Or on the other hand, much more could easily be done in amalgamation, by careful line-breeding. That process was abandoned too soon, because of too much breeding back to the Pheasant, which lost size and colour: by breeding back more to the Mooney, size and colour could be retained. With the greater skill breeders have now acquired, it would be easy to throw in enough of the cock-breeding blood (already at least half Mooney) to produce practically a large *full-tailed Mooney cock* with clear tail and good lobes, still retaining the colour. There was once a real sub-variety of Mooney cocks with very dark, full tails, but it died out through selection for the hen-cocks; and the restoration of full tails while keeping up the colour, which could easily be accomplished, would do much for the breed, as so many hen-tailed cocks are sterile.

At present any novice should put himself in the hands of a breeder, who if applied to will generally supply birds with the necessary relationship, and properly mated, one sex in each pen being, of course, according to exhibition type. As was justly pointed out by the Rev. C. D. Farrar in a series of interesting letters,* Hamburgh breeders naturally get rid early of all chickens of the "wrong" sex which they are not likely to want; therefore application should be made early for young stock before it is gone; or else endeavour should be made to purchase a breeding-pen, when breeding is over for the season. Many then desire to make room, and such a pen can therefore be sometimes procured below its real value.

Golden Spangled Hamburghs.

The Gold-spangled Hamburgh is broadly similar to the Silver, substituting a rich golden-bay ground-colour for the white; but there are differences in the neck and in the tail. The tail of the hen, and both the true tail and the sickles and coverts of the cock, instead of being a clear ground-colour with spangles at the tips, are of a rich and glossy solid green-black. And the hackles of both sexes, and saddle and back of the cock, instead of being spangled or tipped, or as near this as possible, are golden bay *striped* with glossy green-black; even the hen's tail-coverts being more a large black centre laced round with bay, than really spangled. The cock's wing-bow also, while now desired and standardised as deep bay with dagger-shaped tips to the feathers, as in the Silver, is still very commonly almost a self-colour, with little spotting at all; but this point is improving. The head points and body marking are as in Silvers, but the birds as a rule are much smaller. It is remarkable that the striped hackles and black tails in this colour, represent a marking almost similar to the old and now extinct *full-tailed* Silver Mooney breed, referred to above, and was evidently one of the very oldest types of Spangled Hamburghs, and out of which the hen-tailed Silver Mooney was perfected.

There were and still are similar distinctions in the strains of these birds, to those already described in the case of Silvers; but with the curious difference that in the Golden it was the Mooney that was the smallest breed, the cocks especially, and that these were full-feathered; while the hen-feathered cocks which occurred were in the larger and coarser Yorkshire breed. These were fine large birds, and at one time the hen-feathered birds were all the fashion, so that, although there did not lack full-plumaged birds of the same variety, only the hen-feathered were retained. These Yorkshire Pheasants were gener-

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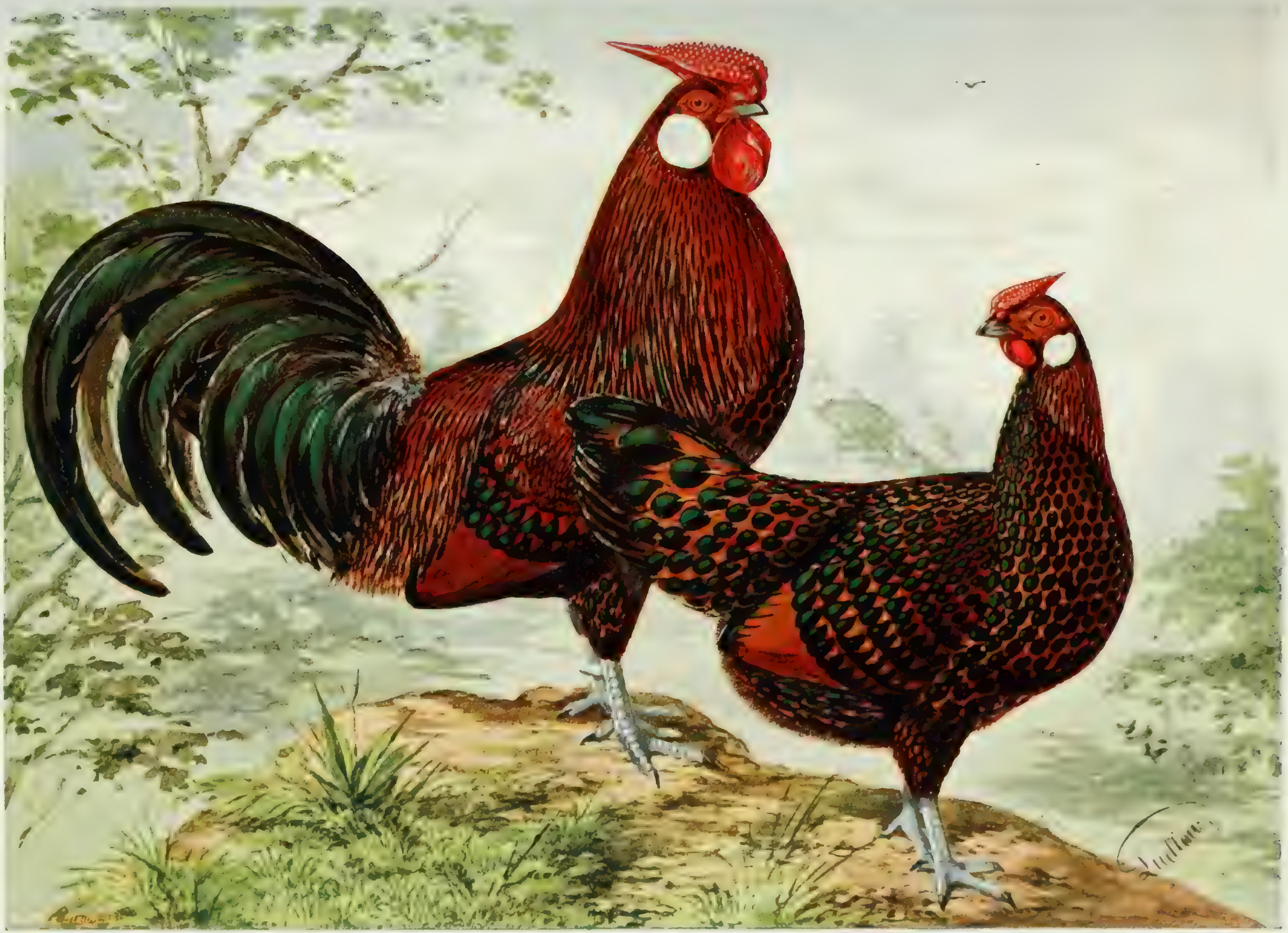
* *Feathered World*, 1901.



VI

GOLD SPANGLED HAMBURGHS.

ally hardy, and capital layers. The spangling was bold and of a glossy green-black, but of a crescentic rather than round form (H, Fig. 126) and the ground-colour was of a light dull bay, and generally there was a good deal of pepperiness in the ground-colour,* so that the spangling was often not clear and sharp-looking, especially in the tail-coverts. As a rule this variety had whitish ear-lobes. In Lancashire there was another variety, cultivated chiefly by the weavers and colliers. This was called the Golden Mooney; it was a much smaller bird, but for colour and marking threw the Yorkshire Pheasant entirely into the shade. The ground-colour of the plumage in these fowls was of the very richest bay, the spangling very bold and clear, and of a green satin-looking black; in fact, the plumage was so rich and glossy that the full beauty of it could not be seen except in the sunshine, but when thus seen formed a picture never to be forgotten. This applied to the hen; the plumage of the cocks was also of the very richest description, but their great drawback was their red ear-lobes and black breasts —in fact, they had no ear-lobes at all to speak of, but merely a bit of red skin like a Game cock. These cocks were never shown, but merely kept for breeding purposes. Shows were held in many of the village public-houses in Lancashire, the competitors being mostly colliers and weavers of the district, to whom is entirely due the credit of bringing the celebrated Mooney marking to such perfection. At these shows hens only were shown, of both Golden and Silver Mooneys and Black Pheasants, but far the most usually it would be one of the Mooney breeds. The birds were judged by a scale of points agreed on by members of these village clubs, the first definite points ever drawn up; and the points were so well understood by all that any disagreement about the judging scarcely ever took place. One of the foremost men at these village clubs was old Jack Andrews, or, as they called him in Lancashire, "The Ould Poo't," meaning "The Old Pullet." Another fine old fancier and breeder was Nathan Marlor; and breeders and fanciers of both the Spangled varieties are much indebted to these two men, who have been greatly instrumental in bringing the Mooney to such a state of excellence.

Breeding Golden Spangles.

Both the breeds thus described being in existence at the early time we have been speaking of, the Lancashire Mooney hens were first shown with the Yorkshire hen-feathered cocks; but when the judges set their faces against the hen-feathered birds (and their reign was very short), the Yorkshire Pheasant's career, as an exhibition bird, was over. After that the cocks shown with the Mooney hens were at first of the full-feathered Yorkshire breed; but neither pure variety possessed the points of excellence required. The Yorkshire Pheasant was dull in ground-colour and not distinct in the spangling; while the Mooneys, especially the cocks, had almost black breasts and red ear-lobes, and if anything (especially in a room) were almost *too* deep and rich in the ground-colour. The necessary change began first with the cocks. In the first place the Yorkshire cock was put to the Mooney hens, and by careful and judicious crossing a bird was produced having somewhat of the richness in plumage of the Mooney, at the same time retaining the spangled breast and whitish ear-lobes of the Pheasant. These were the cocks for some time shown with Mooney hens. After a time, however, as the competition became keener, and richness of plumage became the chief point requisite to success, a little more of the Mooney blood was introduced; and at the present day cocks are bred which leave little to be desired either in that point or in ear-lobes, which have been by careful breeding brought to a perfection neither breed originally had. The hens also were operated upon, the red ears of the pure Mooney being found an eyesore. To remedy this a dash of the Yorkshire Pheasant blood was introduced, which also had the good effect of giving a very slightly lighter tint to the ground-colour; and by this crossing, and judicious selection, hens also have been produced that combine all the richness of the Mooney with a slightly lighter ground-colour and a somewhat whiter ear-lobe. As in the preceding variety breeding from the pure Yorkshire Pheasant is now quite discarded.

For breeding pullets the beginner should get the very best hens from an exhibition point of view that he can lay his hands upon; there is not much need to inquire about the strain, as in a hen this will speak for itself; but if better heads and ear-lobes than usual can be secured all the better, and also what is possible in the way of size. Then let him get a cock from some good breeder out of a well-known pullet strain, and if possible somewhat related to the hens or pullets he is breeding from; for birds bred thus akin produce by far the most perfect specimens. Then if these birds produce first-class chickens, keep them together and breed from them as long as possible, and do not attempt to improve them by a cross, or they may be improved the wrong way. If the produce is not satisfactory, try again; but this simple method of selection will rarely fail, and is about the only one which can be given at the present day.

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* This was probably the reason why in some of the old books on Poultry, "Copper Moss" is given as another local synonym for the Golden-spangled Hamburgh.

For cockerels pursue a similar plan. Get the very best exhibition cock procurable, and put him to a hen or hens obtained from some good breeder, also of the cock-breeding strain; but in choosing them select birds with the necessary points, viz. with smart, even combs, and pure white, well-shaped ear-lobes. It is often difficult to get a cock with really well-spangled breast, but either lacing or too much black should be avoided if possible, and also light brown or yellow hackles, richness of ground being another rather difficult point. Then, as before, if the produce is good stick to it so long as the pen will breed; but if not successful at first, try a change of mating until the produce is satisfactory. While pedigree is the sheet-anchor, as in other cases, it is by this experimental method the best breeders make up their Hamburgh pens until they have a strain of their own, when of course they know its qualities, and can mate up their breeders with something like certainty.

Except in the hackles and tails, the spangling of this variety is so similar to the preceding breed, that the representations of the feathers will equally suffice for them, the crescentic form of the old Yorkshire Pheasant spangling being shown in Fig. 126, H. The latter old breed is now practically extinct in an uncrossed form, being superseded by a stock more or less crossed with Mooney; but its traces are still seen in much tendency to light ground and yellow hackles, and breasts laced or crescentic in marking, or almost black near the throat. To correct these faults, so much Mooney blood has been used, that several winning pullets have been known to be produced by what were known as cock-breeding strains. The Golden Mooneys, on the other hand, often now have so much better heads and ear-lobes than formerly as to show much Yorkshire blood; and although most of the best breeders still employ separate pens of what they consider "pure" strains, there is a smaller school aiming at a greater degree of amalgamation, which can also boast of some success. The existence of these two schools has led at times to debate whether the dark or light —or as it was called in one discussion which we remember, the red or the golden—ground-colour was correct; and perhaps the truth lies entirely on neither side. As already remarked, the very rich ground requires open-air and sun to do the plumage justice; while *rather* lighter colour shows more contrast in the show-pen, and was sought by some exhibitors for that reason. But opinion has upon the whole settled down in favour of the rich ground, almost mahogany; and though further blending may possibly go on in order to improve the hens in size and ear-lobes, it is essential to success in such a course that there be kept in view as the main points, the rich ground and green satin spangling of the old Lancashire Mooney. No breeding that preserves this in the hens, can go far wrong; and there is in this variety one motive which does not exist in the case of Silvers (the Mooney in Silvers being much the largest bird) for some further crossing, in the small size and poorer laying of the uncrossed Mooney strain. The Standard itself now lays down that the colour of the cocks is rich bright bay or mahogany, and the wing-bows ticked; and these points, with the better spangling on breast which is still badly needed, can only be arrived at by either a little more Mooney blood, or breeding up to it: while the white ear-lobes now laid down for the hens, equally require a little more Yorkshire in that strain, and more selection for lobe and head. Could these points be improved, and size and laying increased, without losing colour, and with such further unification of blood, though more or less double mating would still probably be necessary, this variety of Hamburgh might probably become one of the most popular, instead of perhaps the least kept of any.

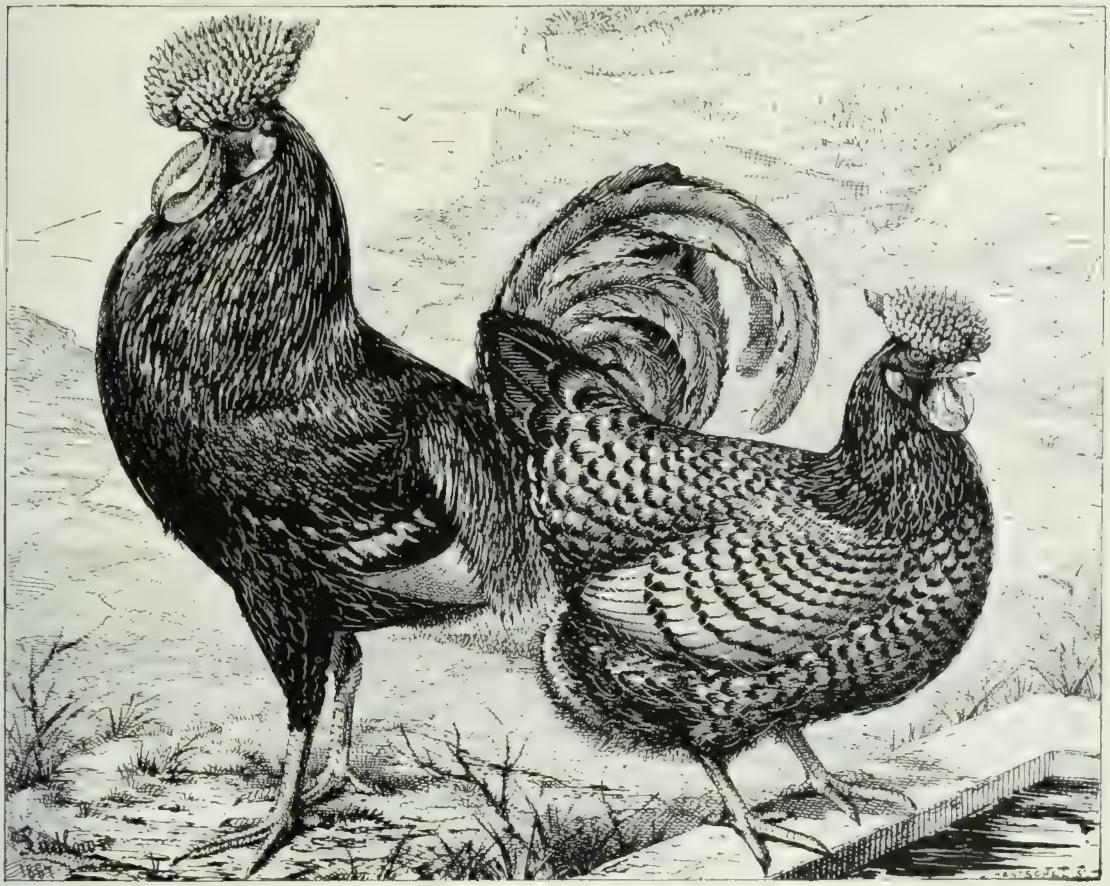
Golden Spangled Chickens.

Some of the chickens when hatched are dark brown, striped with black, others very light, almost yellow, depending doubtless on more Lancashire or Yorkshire blood. The first feathering also differs a great deal, some being much lighter than others; and many are *pencilled* on the wings, but this is not so in all. There is however little or no true spangling in the first plumage, and on an average the darker chickens prove the best; but as this rule is not universal, if the blood is known to be good, it is best to await the adult plumage. Usually the bars of cockerels are not sufficiently heavy in spangling compared with the rest, or may appear semi-laced. In that case it is usual to pull these feathers gently out, beginning at the bottom of the lower bar, and taking out two or three on each side every day: the second bar in the same way, till all have been withdrawn. The bars usually come again much better spangled.

Most of the early poultry books describe amongst the varieties of Hamburghs a breed known as the Redcap, which is undoubtedly

Redcaps.

closely allied to one of those described under the preceding head. These Redcaps have also been known as "Manchesters," Moss Pheasants, and some other synonyms besides those mentioned below. Many years ago, as Redcaps, they used to have classes at the Sheffield shows, but subsequently dropped out, until more recently revived. They always had a very high reputation amongst those who knew them, as useful fowls, and the late Mr. Hewitt wrote highly of them as such in the first edition of *The Illustrated Book of Poultry*. He mentioned in particular the much better carcase, cocks reaching $7\frac{1}{2}$ lbs. to 9 lbs., while the meat was tender and delicate; and the fact that if equal weights of eggs from Spanish and Redcaps were used in custard making, the Redcap eggs went nearly a third further than the others.



Derbyshire Redcaps.

The following short account of Redcaps is kindly supplied by Mr. Albert E. Wragg, of Edensor, Bakewell, who has been largely instrumental in promoting the interests of the variety, and bred them for many years:

"The Redcap is one of our oldest breeds of fowls. It has been kept for a great many years in the counties of Derbyshire and Yorkshire, where it has always been most highly thought of, especially for its laying qualities. Recently, however, it has become better known, and it is now largely kept in the United States, Australia, New Zealand, France, Germany, and Belgium. It is generally supposed to have originated in Yorkshire, and is probably a near relation to the Golden-spangled Hamburgh, having been bred more for size and the large comb. Game blood undoubtedly enters into its composition, as the breed is a very pugnacious one, and a dubbed Redcap cock might almost be taken for an Old English Game cock. It has been known by many different names, such as Pheasant Fowls, Crammers, Copper Fowls, Yorkshire and Derbyshire Redcaps.

"The Redcap cock is a fine-bodied bird of noble appearance. Nothing could be more ornamental than his large, symmetrically-shaped comb, full of a great number of fine long spikes, with leader behind. It should be well carried, firm and straight, and standing well off the eyes. For years Redcaps were bred with very ugly combs—and some are yet to be seen winning prizes—and to this fact may be attributed much of the unpopularity of the breed in many parts of this country. The comb should be as large as can be comfortably carried by the bird. In size it should not greatly exceed five and a half inches in length and three and three-quarter inches in breadth. Birds with ugly combs should not be used for breeding. Frost seldom injures the large combs of Redcaps, for I have had birds roosting in plantations with 26° of frost, and not one has suffered in the slightest degree. The hen is a shapely bird, very active, and a good forager, and as a layer is second to none. She will generally lay from 150 to 200 eggs per year. Redcaps are long-lived birds, and very hardy, and hens three and four years old will frequently lay as many eggs as a pullet. The eggs are white, or slightly tinted, very rich, and of a beautifully delicate flavour, and of good size, weighing about 2 ozs. The hens rarely go broody.

"The chickens are not at all difficult to rear. To produce strong healthy chickens that will give no trouble in rearing, the breeding-pen should consist of a strong active cockerel, mated with large healthy hens of two, three, or four years old. They should have a free range, on grass if possible, and after being mated up, should not be disturbed, either by sending to shows, changing the cockerel, or putting in fresh hens. They breed remarkably true to colour, but will throw some single-combed chickens, especially when the cock is of a different strain from the hens. For breeding exhibition birds it is best to keep to one strain.

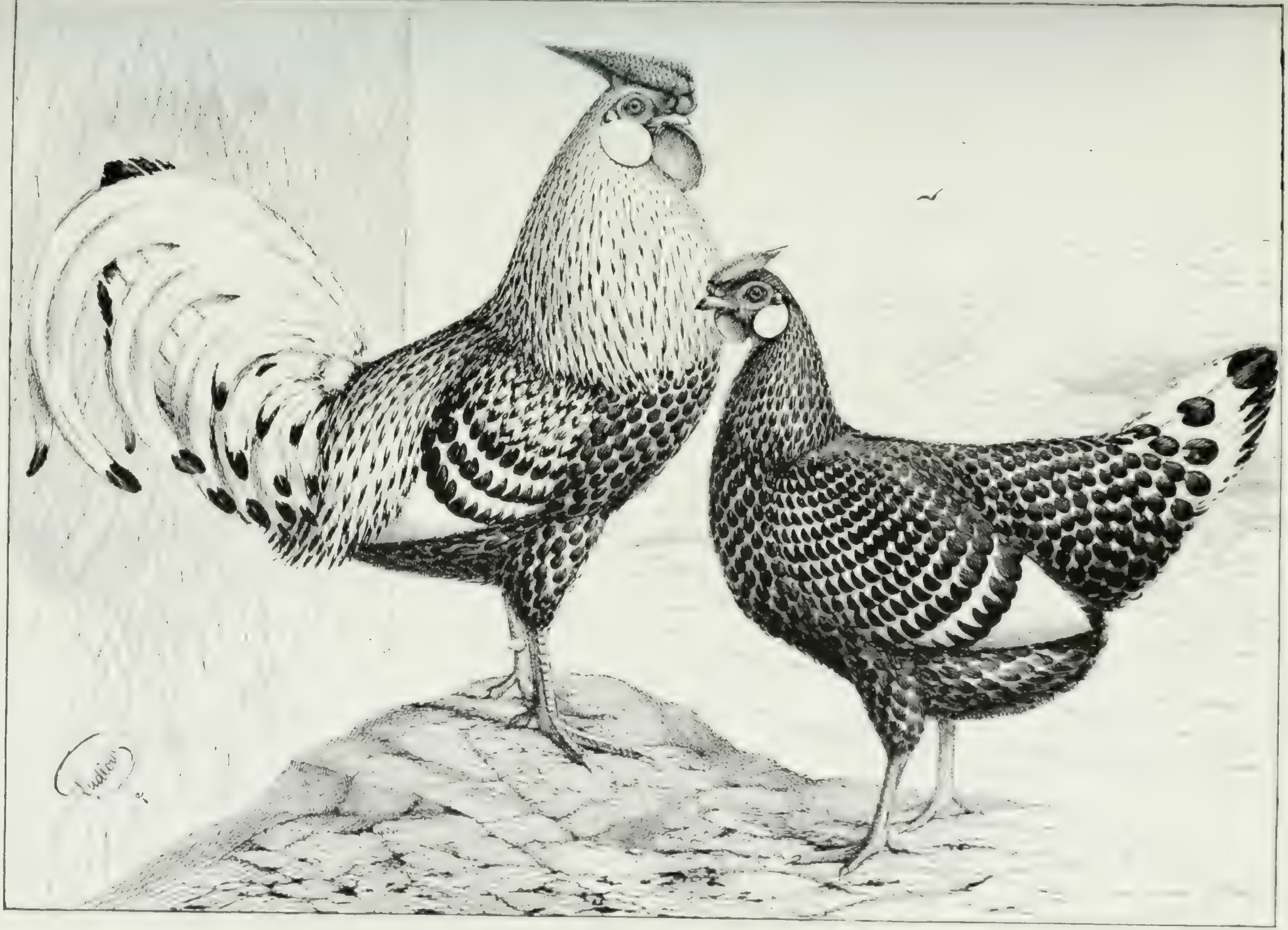
"March and April are the best months for hatching. The chickens feather quickly, and should be carefully watched for insect pests in the hot weather, for these often play great havoc with them. Good plain food such as biscuit meal, sharps, barley meal, wheat, barley and maize (occasionally) will be found the best foods for them. Overcrowding is bad for them, and confined runs are the causes of many failures in rearing them. Pullets hatched in March will begin to lay about September and October, but they are not first-rate *winter* layers except when well sheltered and warmly housed. They are very good for table if reared on large runs; their flesh is white and of delicious flavour, very nearly approaching the Game fowl. They make a splendid bird for crossing with almost any of the other breeds."

The main characteristic of the Redcap is its *immense* rose comb, standing high as well as wide on the head, and covered on the top all over by unusually long spikes. The wattles are long, and the ear-lobes are red, not white as in other Hamburghs. The cock's hackles and saddle feathers are rich red striped with black; breast and tail black; back red, spangled with half-mooned or crescentic black spangles. The hen's tail is also black, hackles red striped with black, body plumage reddish brown spangled with black crescentic spangles. It cannot fail to be noticed how closely the large size and crescentic spangling resemble the old Yorkshire Pheasant, the largest parent-breed of the Golden-spangled Hamburghs already treated of; and if that old breed were, as supposed by Mr. Wragg, crossed with Game, the further gain in size and richness of the egg is exactly what might have been expected.

There can be no question that the Redcap is a most valuable fowl from an economic point of view. It has a really good-sized carcase of good quality; and in regard to laying, stands almost alone in the degree to which prolificacy extends *late in life*, even to three or four years old. This is probably connected with the curious fact that the pullets are not as a rule early layers, but generally seven months old before they commence. A farmer once told us that he had a hen which laid nearly as well as ever up to *eight* years old, but this was exceptional. They are hardy in rearing, and a first-class farmer's fowl.

Breeding Redcaps.

Breeding Redcaps requires some care; but that care should not be given to wrong objects. There has been effort to get "neat" combs; and we have seen it stated that the spangling of a hen was "as good as a Hamburgh." It has no business to be as good as, or in fact at all like that of a Hamburgh, and any such ideas will only destroy the Redcap, without making a decent Hamburgh of it after all. Its proper spangling is crescentic, not round; the spangles should be as black and dense as possible, but have not the Mooney gloss; the ground-colour is red or reddish-brown; the cock's breast is black; the comb *must* be very large: whenever that point is lost, the bird will be a Redcap no longer. Size of body in itself must never be overlooked, and it must not be forgotten that the ear-lobes are red. We have seen already birds which in their whitish ear-lobes, smaller size, and too great approach to Hamburgh ground and spangling, gave regrettable evidence of an



SILVER SPANGLED HAMBURGHS.

endeavour to breed them to Hamburgh lines. Yellow hackles should be particularly avoided, breeding dull and washy chickens; neither should the black striping be too heavy. Hens not rich enough in ground-colour, or with spangling too much like lacing, should also be discarded: such birds appear to be of the same stamp as the yellow-hackled cockerels. If these points are kept in mind, the Redcap, being originally a coarse breed of natural sex-colours, will be found to breed fairly true, and both sexes from one mating.

Silver Pencilled Hamburghs.

Pencilled Hamburghs are smaller and lighter in make than the Spangled, and the Silvers and Golds were formerly known in Lancashire as Bolton Greys and Bolton Bays respectively, while the Silvers were, and still are sometimes, called Chittiprats. They are very obviously closely allied to the somewhat larger but single-combed breeds described in a subsequent chapter as Campines and Braekels; indeed, a rose-combed Campine would be almost exactly a Pencilled Hamburgh of fifty years ago, but long breeding has reduced the size of that bird, and refined the pencilling of the hens, and altered that of the cocks, till the appearance of both has been considerably changed. The cock depicted in the early poultry books is however evidently pencilled on the body, very much as the Continental breeds just mentioned are at this day.

The head-points of the Silver-pencilled Hamburgh cock resemble those of other varieties, except in greater neatness and delicacy of appearance, the comb being somewhat smaller. The head, hackle, back, saddle, breast, and under-parts should be a clear silvery white, free from straw-colour. The true tail feathers are black, the sickles and side feathers rich glossy green-black up the centre, only edged with a fine white lacing, as sharply defined as possible. The marbling and splashing or grizzling with white which once were common, is impossible now for a successful bird. The wing-coverts or bar-feathers are generally more or less coarsely pencilled on the upper or invisible web, the tips sometimes showing a slight line of black across the wing; this slight bar was once cultivated, and is still allowed, but a white wing is now preferred. The secondaries are also usually black or coarsely pencilled on inside web, but this is invisible. Formerly these feathers were black on the outer web also for a narrow band next the quill, but this dark colour is now discouraged. The fluff on the thighs is also now preferred as white as possible, whereas some pencilling used to be bred for there also. All these changes have been in the direction of breeding a whiter cock than formerly.

The pullet's hackle also should be silvery white and clear, but near the bottom is hardly ever so now. The rest of the body should have each feather distinctly pencilled across with narrow bars of black, as distinct and clear as possible upon the white ground (or in the case of Golden Pencils, golden ground), and as *straight* across the feather as possible. The pencillings should show a rich green gloss, and range as much as possible into lines round the body, as in what are termed "ringlets" in Plymouth Rocks. The finer the pencilling, and therefore more numerous the bars, the better; and the marking should extend from under the throat to the end of the tail. On the breast the pencillings will be fewer, and under the throat is a particularly weak place, very apt to come merely spotted, or with horse-shoe markings: but some birds are well marked even in this region, though not so well as elsewhere, and though the best ones are generally most marked on the hackle. The fact is that breeding for pencilling alone always tends to produce pencilled hackle also, as we have seen already in Partridge Cochins and Brahmas. The tail should be well pencilled straight across, and this is not so very rare in the two top feathers of the tail itself; but it is curious that some pullets properly pencilled there will fail in the longer tail-coverts, and *vice versâ*, so that a fine all-round complete tail is rather rare.

Breeding Silver Pencils.

It is in the pencilling of the pullets that most change has taken place since 1870, as will be seen from Figs. 127 and 128, the former being photographed exactly the size of nature from winners of the present day, whilst Fig. 128 exactly represents, also of the natural size, feathers supplied by Mr. Beldon in 1870. It will be seen that the bars are much more numerous, finer, and straighter than those of thirty years before. Most writers state that the black bars should only equal the light spaces in width, and feathers are often drawn so: but it is to be observed that such feathers are *drawn*, never photographed, and have not been really seen yet, while our photographs are taken from two of the best cup-winners of the year 1900.* This change has partly caused, and partly been caused by, a considerable change in the method of breeding. When Mr. Beldon wrote in 1870, cockerels were selected by breeders and accepted by the judges with distinct bar upon the wing, and dark secondary feathers, and such cockerels would produce pullets of the pencilling then deemed satisfactory. But purer white bodies were desired for the cockerels, along with finer pencilling for the pullets; and the two were incompatible. Some good breeders had always bred from two pens, and these found that their best cockerels bred pullets with more white ground, and coarse marking: in fact pullets could only be bred at all from the same pen as cockerels, while the coarser marking of Fig. 128 was accepted as the standard. Sometimes pullets almost white came from these pens, and these often bred good cockerels if black in tail. Cockerels are now therefore bred always in that way; an exhibition bird naturally good in comb and ear-lobes, and silvery in colour, being mated with pullets or hens of the same strain, the blood being the main thing, as without it birds which look just like them may be worthless. These pullets will sometimes be nearly white, but more often coarsely and rather lightly marked over with a coarse marking somewhat like the breast-feather of Fig. 128.

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* Mr. Pickles had kindly supplied a full set, in duplicate; but one of the most important feathers being too much damaged in transit, and such feathers being too precious at that season to be plucked freely, Mr. W. Roberts kindly supplied a substitute. Except for the damage to the first, the second could scarcely be distinguished.

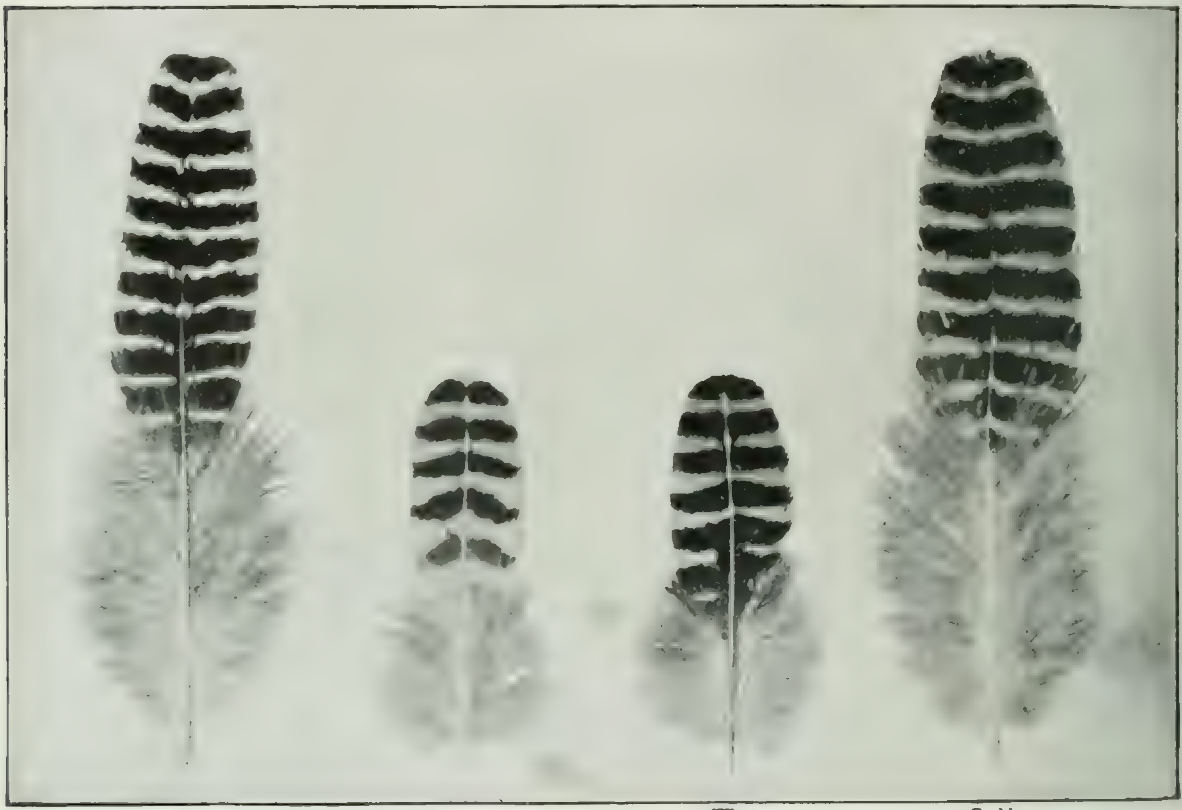


Fig. 127.—Feathers of Pencilled Pullets, 1900.

With pullets another course is pursued. The cockerels from the best specimens were found to have the most of the coarse pencilling on the inside web of the wing-coverts. By selecting for this, cockerels were soon produced considerably pencilled on the wing, and with touches of pencilling on the body, with almost black tails. Still breeding for finer pencilling alone, cockerels were bred, exactly as in the spangled breeds, with hen-feathered tails, and pencilled all over exactly like the pullets, from the top of the breast to the tip of the tail. It is rather curious also, that in thus following up marking alone, the ear-lobes often came reddish and the heads coarse, precisely as in the Lancashire Mooneys. Pullets are now always bred in this way, mating the best that can be got, with fine pencilling, and a cock or cockerel bred from the same strain. If he be of the hen-feathered pullet-marked type, he will speak for himself: the pencilling will show what he may be expected to do. If he is of the full-tailed and black-tailed type, the fineness of the wing-pencilling is still some guide, but one's real dependence, if purchasing, must be upon the breeder. After a while, of course, the fancier will have matters in his own hands.

This change in Silver-pencilled Hamburghs and their breeding has not been without injury, and the variety is not without some drawbacks. The persistent breeding for fine pencilling has very perceptibly diminished the *size* of the fowl from what it once was, and increased its delicacy. The feathers in Fig. 128 are not only coarser in marking than the others, but it will be seen that they are considerably larger, which means that they came from a larger bird. Such dwarfing means also a smaller egg, and a weaker constitution, the Pencils being notoriously subject to roup. The best antidote to this is the free open-air system. One reason for it is, that finer pencilling is generally bred from pullets than from hens; and in the long run such breeding, from small birds, always produces weakness.

This is connected with what is perhaps the greatest drawback of all in Pencilled Hamburghs. As a rule the pullets, especially Silvers, can only be shown as such: after the first moult the pencilling usually becomes coarse, and their career is over, and they are valueless except for breeding. A very small proportion preserve their fineness of marking; and such are particularly valuable as breeding stock. It would very much increase their popularity if they could be made to last; and it is probable that this might be effected if opinion would only tolerate a *slightly* coarser pencilling, but still finer than that of years ago, and with the greater straightness now attained. The ear-lobes turn coarse also, but in a hen this is tolerated if the pencilling remains good: as in the Mooneys, it must be put up with if perfect marking alone is to be considered.

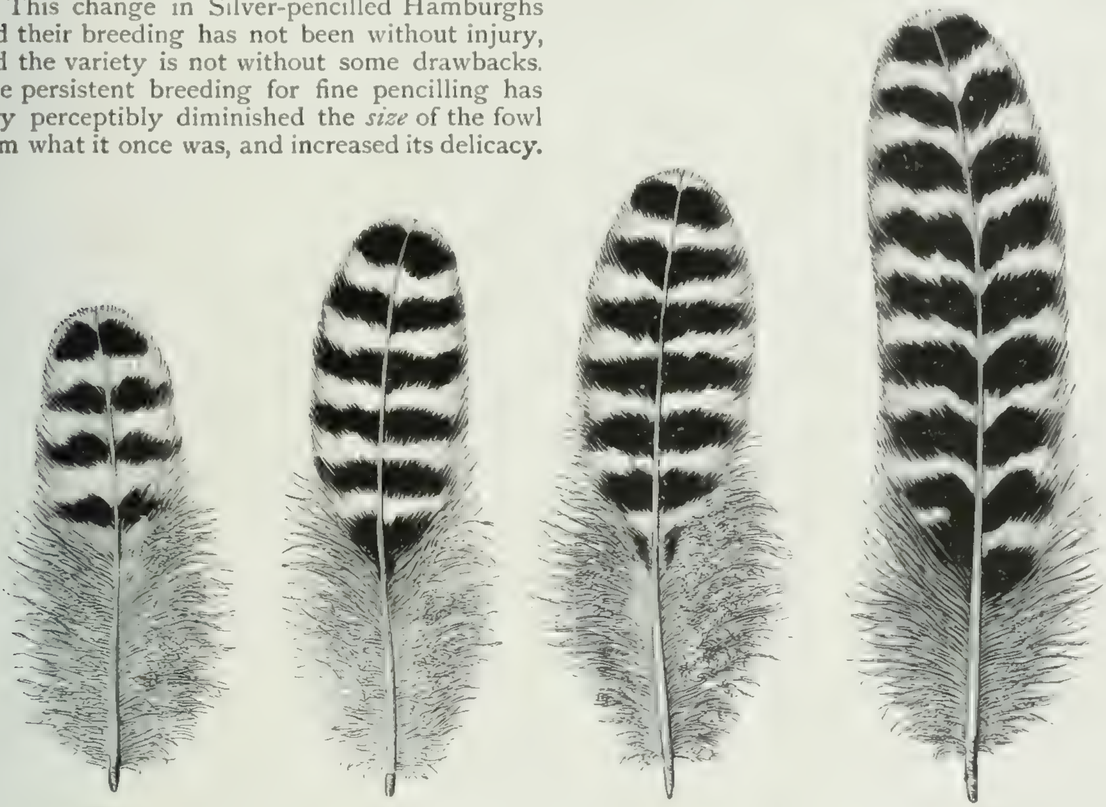


Fig. 128.—Feathers of Silver-pencilled Pullet, 1870.

Pencilled Hamburghs have one rather curious characteristic, quite apart from their markings. If taken up, or roughly disturbed, or terrified, especially at night, they *scream* in a very peculiar way, and with a persistency (unless let go) that makes a very effectual alarm in the case of poultry-thieves.

The Golden-pencilled Hamburgh is in every respect save ground-colour similar to the Silver-pencilled breed. The ground-colour in the

Golden Pencilled Hamburghs.

pullets should be about the colour of gold, as rich and bright as possible; the pencilling being exactly like that of the preceding variety, as distinct and yet as fine as can be got; that is, as many bars as possible across each feather, provided they are distinct, straight, and of a good rich black colour. The neck-hackle, like the Silver birds', should be clear. The cock is of a deeper tint, his colour being somewhat between that of his own hens and of a Red Game cock; it is described in the Standard as a red bay, while the pullets are termed golden bay; it must be neither too red nor too pale, but what might be called very rich in effect. His proper tail-feathers are black; the sickles and side hangers rich black edged with bronze or gold, the edging being usually rather wider than in the Silver-pencilled bird, but a fine narrow edging is much the best for a breeding bird, though not so showy in the pen. Sickles all black, or bronzed all over, with scarcely any black in them, are now out of the question, though at one time they were tolerated. Besides the quality of the black pencilling, one of the points in this variety is the evenness and richness of the ground-colour. Some pullets, otherwise good, are uneven in this point, the ends of the feathers being a lighter colour than the other parts. As summer advances most birds fade in colour from the effects of the sun; but some pullets of a good rich ground retain this much better than others, which is, of course, a great point in their favour. In the cocks the same fault is commonly seen, appearing in the shape of a lighter shade on the tips of the feathers on the breast and under-parts. This fault is to be particularly avoided.

Breeding Golden Pencilled Hamburghs.

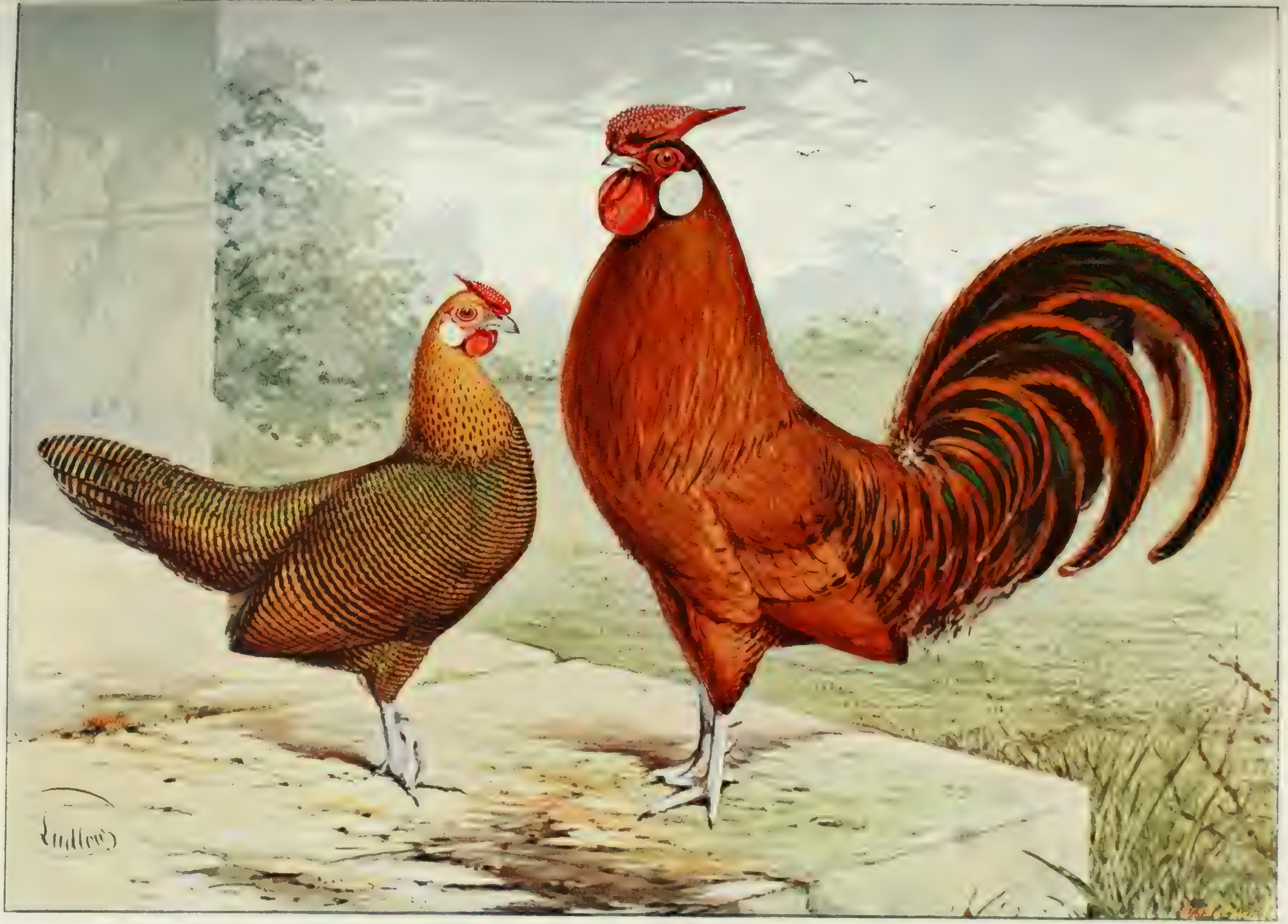
The breeding of Golden-pencilled Hamburghs is much the same as for Silver Pencils, putting a cock or cockerel of exhibition type, of as good a colour as possible, with neat head, comb, and lobes, and sharp *narrow* edging to his sickles, with hens of the same strain. Patches of dull brown or clay-colour are especially to be avoided in a brood cock. The hens will be of a reddish gold, and usually pencilled coarsely all over; but the known pedigree, or relationship to good exhibition birds, is the chief thing. Pullets are almost always bred from cockerels or cocks more resembling the full-tailed Silver-pencilled pullet-breeders mentioned above; in fact we have heard of very few hen-tailed pullet-marked cockerels appearing in this variety; and when they did there was much suspicion of a Silver cross. They are usually full-tailed, with very dull and dirty lacing on the sickles instead of the bright bay of exhibition birds, but have a good deal of pencilling on the wing, and often touches on the rest of the body: the ground-colour (except lacing of the tail) is generally very dark, almost maroon. Again pedigree is the main point with the breeder; next to this he looks to the fineness of the pencilling on the cock's wing. As to the pullets, they speak for themselves.

Golden-pencilled Hamburghs last better than the Silvers, good moulted hens being seen occasionally, and such being especially valuable. There have been curious variations at times in the ground-colour of the pullets, from very deep indeed, almost pale mahogany, to quite pale yellow. In some of the latter birds we have seen patches of almost white, and suspect a cross with Silvers. The Standard description of golden bay, generally understood to denote the colour of a new sovereign, should terminate such variations, and this moderately rich ground-colour is usually pencilled with the richest green-black. In the full summer sun this colour will fade somewhat, especially at the tips of the feathers, and must be watched over if deemed necessary, as in buff fowls. But this is at a cost, since the best stock can only be bred in the open. A piece of wood or shrubbery on light soil answers all purposes.

Black Hamburghs.

Under the name of Black Pheasants, the Black Hamburgh was known and exhibited a hundred years ago at the Lancashire village shows already alluded to. In those days it was of unmixed Hamburgh blood, and the opinion of the late Mr. Teebay and some other old breeders was, that it was originally bred from the full-tailed Silver Mooney, many chickens of the latter coming almost black. The birds of that day were shorter in the leg than now, and of the same shorter formation generally as the older Mooneys, and with ear-lobes much smaller and coarser than now. This old breed was undoubtedly crossed with the Spanish, in order to improve the size and quality of the ear-lobes; and the size of the fowl and of its egg were both improved at the same time, while it likewise became more suitable in disposition for small runs. Unfortunately, the cross also introduced a considerable tendency to white in face, and some coarseness about the head, which have required a great deal of breeding out; the form of the bird also became somewhat taller, though anything like the stilty carriage of the Spanish is most objectionable, and the usual Hamburgh carriage should be sought as far as possible.

The Black Hamburgh of the present day is a most striking bird, the combination of



4 GOLD PENCILLED HAMBURGHS

bright carmine head and face and comb, smooth white kid ear-lobe, and lustrous green plumage, making a most beautiful whole. The ear-lobe is considerably larger now than even twenty years ago, that of the cock being about the size of a florin; it should be round in shape and smooth all over, perfectly free from folds or lines or creases. Such a lobe is, of course, very apt to be accompanied by more or less white in face, especially under the eye, a fault much more common in Blacks than in any other varieties of Hamburgh. Very few old birds are indeed free from it, but in young ones it is a serious fault. A gipsy tint sometimes seen is also disliked, a cherry red being the desired colour. In combs also there has been a perceptible change in fashion, in the direction of a longer spike or "leader" at the back, especially in the cock. Both sexes are of rather larger size than other Hamburghs, except perhaps some of the larger Silver Mooneys, and the cock is of somewhat more commanding carriage, and should be particularly long and full in feather about the saddle and tail, the sickles and side-feathers being broad, but as sound and close in web as those of a Game cock. The shanks should be dark leaden blue, and are very often nearly black up to a year old, but after that usually get lighter with age.

Breeding Black Hamburghs.

But the great point in both sexes is "colour," which should be of the glossiest *green* lustre which it is possible to get, as distinct from either a purple or mazarine gloss, or a mere raven black. The bird should be a green bird, rather than a black one, though of course the colour is scarcely this about the fluff. It is hard to get really green tails, but the ends even of the true tail feathers ought to be green, and the side-feathers conspicuously so. The neck hackle also is often more black than green; and when really bright is too apt to have red feathers interspersed among the others. Then also the purple or the mazarine is cropping up every now and then.* Altogether, breeding Black Hamburghs for exhibition is not easier than breeding other varieties, and requires much care to get the desired "colour" in combination with other points.

These other points have been increased in difficulty by the changes above noted, which are much to be regretted, and have, as is well known, actually driven several eminent amateurs out of the fancy. The long spikes or "leaders" to the comb now desired, are almost impossible to keep up naturally, and nearly every comb now exhibited shows marks of treatment, as may be seen in those "glossy"-looking portions already referred to on page 234. The exaggerated lobes are often rather too long or misshaped, and trimmed up to the necessary roundness. On cocks as now exhibited, these large lobes have become almost as liable to scab and blister as the faces of Spanish, and require constant care of the same sort; and those of the pullets and hens, though much smaller in actual measurement, are now preferred larger *in proportion* than those of the cocks. To obtain these it is necessary to select cocks or cockerels for pullet-breeding with abnormally large ears, which are almost useless for cockerel-breeding, and the male progeny from these is only valuable for the same purpose again. The size of the ear-lobes makes it especially necessary to be very careful in selecting a smooth unbroken surface, free from creases, to which many are liable.

Colour is now bred in two ways. One way, no doubt the better if it can be followed, is to mate up the greenest and most glossy birds on both sides, carefully avoiding any purple or mazarine shade. If the male bird can be found bright enough, and the females are also good in colour, the pullets produced will in colour be all that can be desired, as well as the cockerels. But it is not at all easy to obtain such birds; and it will be found that many of the male produce from the very best-coloured hens or pullets, have a great many red hackles amongst their neck and saddle feathers. Such a red-hackled bird, bred from very lustrous hens, or from the same stock as a good exhibition strain of females, is therefore often mated with such hens or pullets to keep up the colour, and will often produce good green pullets even from hens by no means specially good in colour, if of the same breeding.

The other points already mentioned tend further to develop this double-mating system. It is obvious that for cock-breeding we must have a male as perfect as possible in comb, with ear-lobe not larger than desired, smooth, and well-shaped, a red face with no trace of white, and plumage entirely free from red feathers or purple gloss; while the hens must be as glossy as possible, but will be all the better for smaller ear-lobes than are desired for the show-pen. For pullet-breeding, on the other hand, we must have in all the hens the full-sized ear-lobes desired, and a male with extra large lobes as above, and brilliant colour; he may, however, have a considerable amount of red in hackle, and need not be so perfect in comb. It is greatly to be desired that a return to the more moderate combs and ear-lobes of the older Black Hamburgh should moderate these tendencies towards a double strain of birds, which have already perceptibly diminished the spread and popularity of the breed.

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* Bars of purple or mazarine, something like those of a Pencilled Hamburgh, will often occur from even a change of diet, or any slight illness, while the feather is growing. Even marked changes in the weather at that time, appear to leave such traces occasionally.

The Black Hamburgh is one of the most generally useful of all the varieties. It is of fair size, enough to make a decent though not large fowl upon the table, while the meat is of most excellent quality. The egg also surpasses those of other varieties, except perhaps of some Silver Mooneys; most of them will average two ounces each, or eight to the pound, and some are more; and these are laid quite freely, many pullets beginning early in November. Finally, the variety is hardy, and appears to thrive best of all the Hamburghs in confinement, having been known to do well even in a covered run. This merit is probably due to the Spanish cross, and is the one benefit which that cross really has conferred upon the breed. Black Hamburghs are also little trouble for exhibition, though more so than formerly, owing to the ear-lobes. These need attention of the same kind as those of Minorcas, if the birds have been exposed to the weather; and they should be either kept or got into soft, kid-like condition, by washing and the powder-puff, in the same way. As a rule, shelter rather than darkness is required, though a subdued light has good effect upon the lustre of the plumage, as well as upon the white kid, and a week in a dark pen is often necessary.

Black Hamburgh chickens are, when hatched, white on all the under-parts, the back and upper parts black, sometimes with a shade of brown. They are not always black all over, even in their first chicken feathers, but become so with the adult plumage. If disturbed or seized at night, Blacks have the same screaming propensities as we have already noticed in the Pencilled breeds.

These notes were put together for our last edition from a former article by the Rev. W. Serjeantson, of Acton Burnell, Shrewsbury, some subsequent notes and comments by him, and one or two notes by Mr. Pickles; and still hold good.

Various Off-Colours.

White Hamburghs were bred many years ago in Lancashire—we can remember them back to about 1866—but afterwards died out. They belong to the Pencilled family, and were no doubt produced by breeding together the lightest of these. About 1900 they were seen again, plainly owing their revival to the development of very white cock-breeding pullets, and for a time found a place in the Standard. They lacked contrast for the white ear-lobe, and are now apparently defunct as exhibition birds. In breeding them, select cocks with glossy and silvery white top-colour, and neat heads.

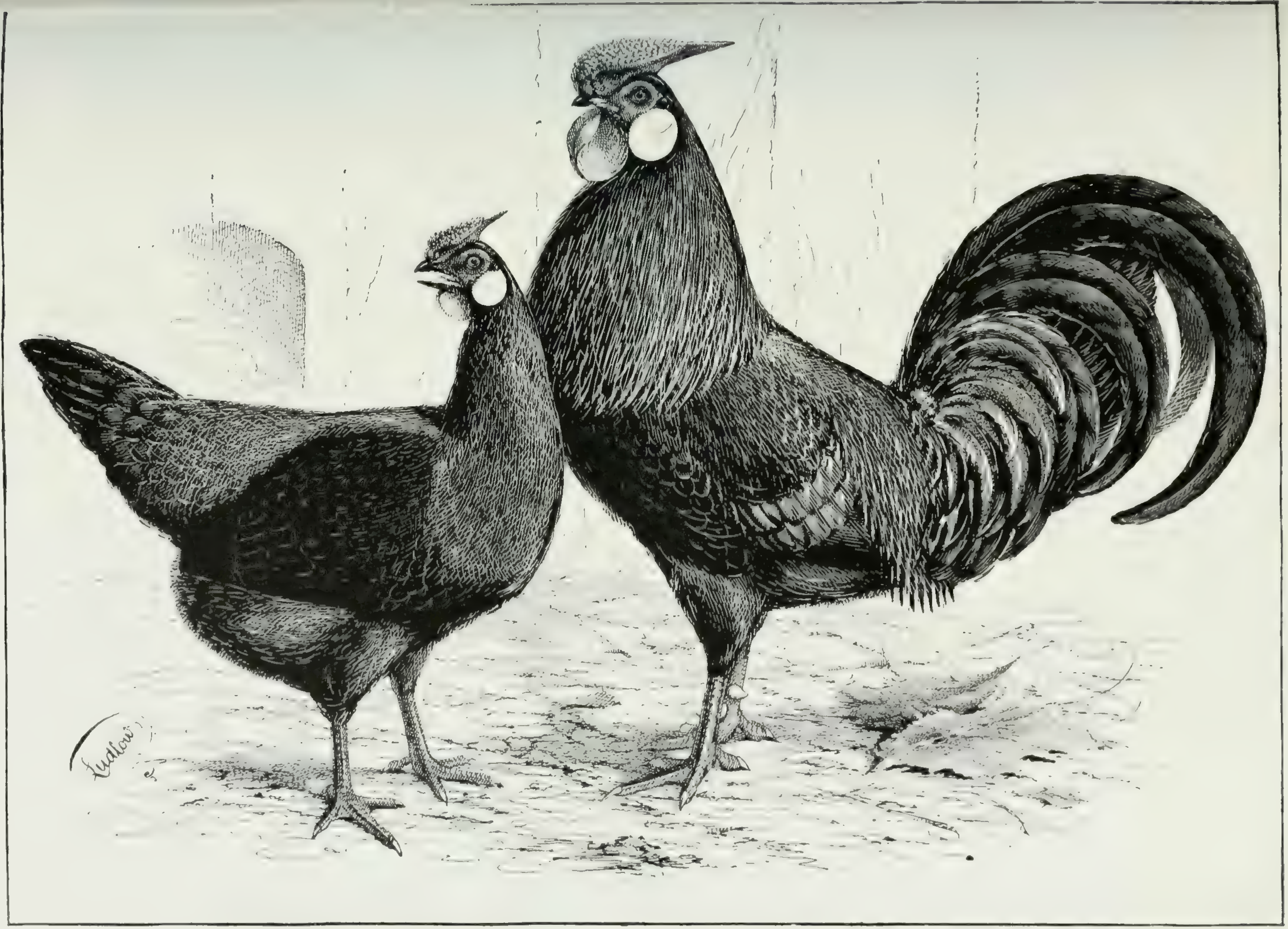
In our notes, collected during many years, we find also mention of a Silver *laced* Hamburgh; a Black Hamburgh laced with white on the breast; and a Buff or Gold-pencilled with *white* instead of black. This latter could no doubt be produced by crossing White with Gold-pencilled: those seen were never liked, however, the effect in this marking being disagreeable. Mr. Beldon himself possessed at one time a breed of Cuckoo or blue-barred Hamburghs, which bred very true, and may have resulted from crossing White with Black; but these also found no favour.

The Buff Hamburgh has not gained a footing, for it lacks marking and lustre. Mr. Beldon mentioned Buffs long ago, but we believe all known before 1870 had died out. Of some since seen, little disguise was made of the fact that they had been either made, or at least improved by a cross with the Buff Leghorn, of which a rose-combed variety has been several times attempted. Another strain is stated to have originated from a cross between a Gold-spangled cock and a very light cock-breeding Silver-pencilled hen. The dark legs will always be a difficulty to keep up when combined with clear buff plumage free from dark markings, and such a colour seems to have nothing but novelty to recommend it.

The purest strains of all Hamburghs will every now and then produce chickens with single combs, the more especially when small and neat combs are bred together. Such an occurrence is no proof whatever of any cross in the strain, as some have thought; it is more probably a reversion to the ancient progenitor of the family. In this connection it is interesting to note that the Turkish fowl of Aldrovandus already referred to, appears to have had a single comb, and that such a single-combed Pencilled fowl exists to-day in the Braekel or Campine.

Exhibiting and Judging.

Hamburghs have some drawbacks as exhibition fowls; never looking so well in all points after the first year. The Pencilled breeds in most cases lose the fineness of their pencilling, and in all varieties the ear-lobe generally loses much of its smoothness, and often becomes tinged with red after that time, especially if the birds are allowed to run at large. The late Mr. Beldon was generally acknowledged to



BLACK HAMBURGHS.

bring out his old birds in better condition than most of his competitors, and this was greatly due to his system of keeping them under cover. He had an old disused cotton-mill at his command, the spacious floors of which were partitioned off into pens from 6 feet to 10 feet square, littered with gravel and straw, and well lighted by windows. Here the birds could be kept quite out of wind and sun, yet with plenty of light, and were in perfect health under the sedulous care of the late Mr. Job Rawnsley. Not many can have the advantage of such space for penning ; but the lively disposition of Hamburghs makes it very advisable that any necessary confinement for reasons of lobe and colour should be in as large pens as possible. They need, of course, a little training in exhibition pens as well, and cocks will stand a week or two of this ; but Hamburgh hens and pullets often go back in condition if kept any length of time in small pens, and are better only thus treated at short intervals, with more liberty in between. Even thus the pens should be larger than usual, say about 3 feet square.

But the real difficulties of exhibiting Hamburghs have been more serious than these. They consisted, first of all, in that complicated system of double-breeding—for it was more really that, than what is expressed merely by double-mating, as now ordinarily understood—already described. Such a system necessarily kept the breeds to which it was applied in the hands of a select circle who understood it ; nearly all new-comers who were attracted by the beauty of the fowls and their wonderful laying, being one after the other disheartened by their inability to produce progeny like those which they so admired. But worse followed. The ideals pursued, and the smallness and wonderful skill of the *coterie* which pursued them, have led to an amount of trimming in Hamburghs as yet unknown in any other breed. Such combs as are now required *cannot* be shown honestly save in some rare case out of scores, and the vast majority are cut and carved into shape, as anyone can see from the glossy scars ; while again and again needles and pins and wires and threads have been extracted from them, having been used to get or to keep them in shape. A certain number may be bred in the first place ; but the long spike now demanded soon begins to drag down by its own weight ; or if not, the heat of a show soon causes it to droop, and then it has to be "set up," which in any way is a most cruel operation. False sickles have repeatedly been found fastened in, in such an ingenious way that even opponents who have "bowled them out" have expressed their free and ungrudging admiration, and with entire good feeling—we speak of what we have heard and seen. As to "thinning out" spangles, we have already shown that this *must* be done if the large spots now bred are to be seen. The broad practical result has been to make of Hamburgh-breeding for exhibition a somewhat peculiar *cult*, whose followers form almost a circle of themselves, with their own accepted methods and ideas of what is fitting. On the other hand, we have heard it said again and again by outsiders who have tried it and given it up again, after finding out what had to be done, that "no gentleman could show Hamburghs," and we know such an impression to be very widespread indeed. That is exaggeration, perhaps, though we do think that (with the exception perhaps of the Pencilled varieties) no lady could do so without aid from her "man" of which she was happily ignorant, and that few gentlemen would wish to, while the present system is connived at and encouraged by the judges. And there are certainly some signs of matters mending. We have gladly chronicled already some reaction against excessive size of spangling, which may possibly go further ; indeed, will have to go further if "thinning" is to be avoided, and could certainly go further, with the result of still further increasing the beauty of the fowl to ordinary eyes.* Comb-trimming also is beginning to receive more steady protest than formerly. But there has been too much ground for the feeling ; and any such impression on the one hand, combined with practical restriction to a small circle on the other, while it produces specimens almost matchless from a certain point of view, and may even increase the price of a few such specimens in their own peculiar market, is ruinous to a breed as regards general classes, or any wide popularity or usefulness.

Judging Hamburghs very largely resolves itself into vigilance in regard to the matters just referred to, or at least should do so ; the main "points" being well understood, and seldom in much doubt. Up to the present we have never heard of any judge penalising "thinning"—in other words, wholesale plucking of spangled feathers—since the days of the late Mr. Teebay, who did "pass" a few cases for reasons which he showed us ; nor does such penalty appear expected or demanded in Hamburgh circles.

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* As a proof, see the drawings of Spangled Hamburghs, by all artists without exception. All birds thus represented show the "spotting" all over, and are much smaller in spangles than Mooneys as bred even in 1900. This is perhaps the only case in which the "ideal" of all artists has rebelled, from sheer necessity, against the ideal in one point (size of spangle) of the fancier.

This being so, the question arises whether such thinning should not be legalised, in the same way as trimming Spanish faces. It should, we think, be one thing or the other. The fact is, and it ought to be known, that *the judges*—and one now deceased judge in particular, who persistently encouraged combs that could not be honest, while he deliberately winked at the methods by which they were "made"—have been mainly responsible for the present state of things. Comb-trimming, at least, is not at all difficult of detection; and its bare-faced toleration has done more to deter the genuine amateurs from attempting to exhibit Hamburghs than anything else.

The Standards of the Poultry Club for Hamburghs and Redcaps are as follow:—

HAMBURGHS

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Fine. *Beak :* Short. *Eyes :* Full. *Comb :* Rose, firmly and evenly set on the head, square fronted, gradually tapering towards the back and narrowing into a long, finely-ended spike or leader pointing in a straight line with the surface of the comb, and without any downward tendency, the top level and covered with small coral-like points of even height, and free from hollows. *Face :* Smooth, free from coarse skin and stubby hairs. *Ear-lobes :* Smooth, round, and thick, varying in size according to sex and variety. *Wattles :* Smooth, round, and thin.

Neck.—Of medium length, and covered with full and long hackle feathers coming well over the shoulders.

Body.—Of medium length, wedge shaped, fairly full at the shoulders and narrowing to the root of the tail; well rounded breast, and large and neatly tucked wings.

Tail.—Long and sweeping, carried well up but avoiding "squirrel" carriage, the sickles and secondaries broad and plentiful.

Legs and Feet.—*Legs :* Of medium length, the thighs slender and the shanks fine and round. *Toes :* Four on each foot, slender, and well spread.

Carriage.—Graceful.

Weight.—Pencilled, about 5 lb.; other varieties, heavier.

Plumage.—Very profuse.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—Pencilled, about 4 lb.; other varieties, heavier.

COLOUR

THE BLACK

Beak : Black or horn. *Eyes, Comb, Face, and Wattles :* Red. *Ear-lobes :* White. *Legs and Feet :* Black.

Plumage.—A rich black, with a distinct green sheen from head to tail, and especially on the sickle feathers and tail-coverts, any approach to bronze or purple tinge or barring to be avoided.

THE GOLD PENCILLED

Beak : Horn. *Eyes, Comb, Face, and Wattles :* Red. *Ear-lobes :* White. *Legs :* Lead blue.

Plumage of the Cock.—A bright red bay or bright golden chestnut, except the *Tail*, which is black, the *Sickle feathers* and *Coverts* being laced all round with a narrow strip of gold.

Plumage of the Hen.—The ground colour similar to the general colour of the cock, and except on the *hackle* (which should be clear of all marking, if possible), each feather distinctly and evenly pencilled straight across with fine parallel lines of a rich green black, the pencilling and the intervening colour to be the same width, and the finer and the more numerous on each feather the better.

THE SILVER PENCILLED

Except that the ground colour, and in the cock the tail lacings, are silver, this variety is similar to the former.

THE GOLD SPANGLED

Beak, Eyes, Comb, Face, Wattles, Ear-lobes, Legs, and Feet : As in the Pencilled varieties.

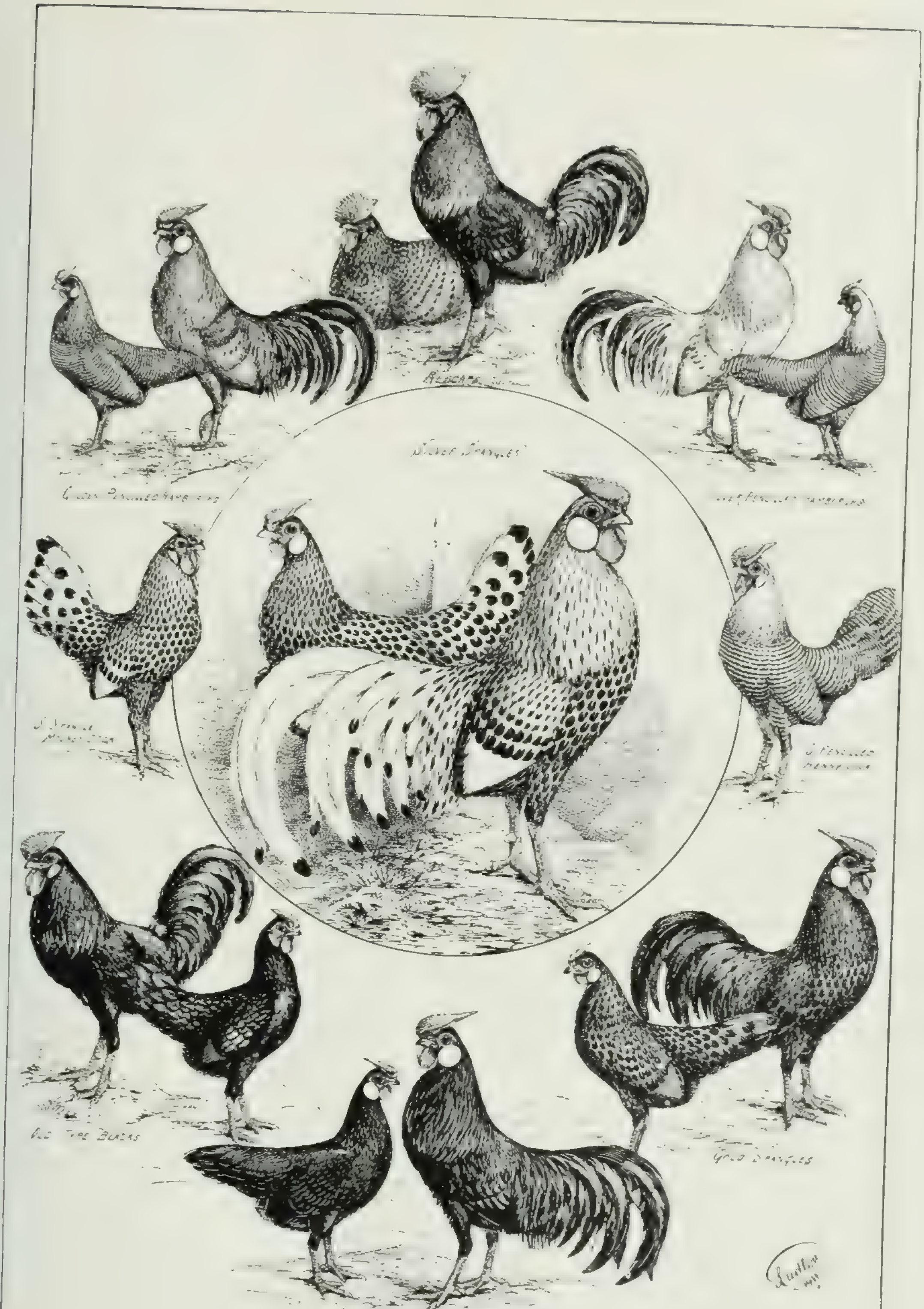
Plumage of the Cock.—Ground colour rich bright bay or mahogany; striping, spangling, tipping, and tail rich green black. *Hackles and Back :* Each feather striped down the centre. *Wings :* Bows, dagger-shaped tips at the end of each feather; bars (two), rows of large spangles, running parallel across each wing with a gentle curve, each bar distinct and separate; secondaries tipped with large round spangles, forming the "steppings." *Breast and Under-parts :* Each feather tipped with a round spot or spangle, small near the throat and increasing in size towards the thighs, but never so large as to overlap.

Plumage of the Hen.—The ground colour and spangling are similar to those of the cock. *Hackle, Wing-bars, and "Steppings" :* As in the cock. *Tail-coverts :* Black, with a sharp lacing or edging of gold on each feather. *Remainder of Plumage :* Each feather tipped with a spangle, as round as possible, and never so large as to overlap, the spangling commencing high up the throat.

THE SILVER SPANGLED

Beak, Eyes, Comb, Face, Wattles, Ear-lobes, Legs, and Feet : As in the Pencilled varieties.

Plumage of the Cock.—Ground colour, pure silver; spangling and tipping rich green black. *Hackles, Shoulders, and Back :* Each feather marked with small, dagger-like tips. *Wings :* Bows, dagger-shaped tips, increasing in size until they merge into what is known as the third bar; bars (two) and secondaries, also *Breast* and *Under-parts* similarly marked to those of the Gold Spangled variety. *Tail :* Ending with bold half-moon shaped spangles; sickles, with large round spangles at the end of each feather; coverts, similar, though spangles not so big.


Redcaps
Golden Pencilled Hamburghs
Silver Pencilled Hamburghs
Silver Spangles
S. Spangle Hamburgh
S. Pencilled Hamburgh
Old Type Blacks
Gold Spangles
Modern Type Blacks 1911
Ludlow

HAMBURGHS AND REDCAPS

Plumage of the Hen.—The colours of the ground and spangling are similar to those of the cock. *Hackle :* Marked from the head with dagger-shaped tips, which gradually increase in width until they merge into spangles at the bottom. *Wings :* Secondaries, as in the cock ; bars similar to those of the Gold Spangled hen. *Tail :* Each feather with a half-moon shaped spangle at the end ; coverts, reaching half-way up the true tail feathers, form a row across the tail (each side) of round spangles. *Remainder of Plumage :* Marked as in the Gold hen.

SCALE OF POINTS

THE BLACK

COCK

Head : comb, 15 ; face, 15 ; ear-lobes, 15	45
Colour	25
Tail	15
Shape, style, and condition	15
	100

HEN

Head : comb, 15 ; face, 15 ; ear-lobes, 15	45
Colour	35
Shape, style, and condition	15
Tail	5
	100

THE PENCILLED

COCK

Tail	35
Colour	30
Head : comb, 10 ; ear-lobes, 10 ; face, 5	25
Shape, style, and condition	10
	100

HEN

Markings	60
Head : comb, 10 ; ear-lobes, 5 ; face, 5	20
Colour	10
Shape, style, and condition	10
	100

THE SPANGLED

The points for this variety (both colours and either sex) are the same as those for the Pencilled hen, given above.

Serious defects : White face ; single comb ; red ear-lobes ; "squirrel" or wry tail ; or any other deformity. (NOTE.—If a Hamburgh has the power to rest its tail on either side at will, bringing the tail over from one side to the other, it shall not be accounted wry-tailed. This is according to the standard of the Hamburgh Club.—W. W. B.)

REDCAPS

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Long and broad. *Beak :* Short and small. *Eyes :* Full. *Comb :* Rose, large, of symmetrical shape, with straight leader, full of fine work or spikes, free from hollow in centre, set straight on the head, not hanging too much in front, and carried well off the eyes ; size about 5 inches by 4 inches. *Face :* Smooth. *Ear-lobes :* Of medium size. *Wattles :* Long and well rounded.

Neck.—Of moderate length, and well furnished with hackle.

Body.—*Breast :* Full and rounded. *Back :* Fairly broad and long. *Wings :* Moderately long, fitting closely to the sides.

Tail.—Full, and carried almost upright, the sickles being broad and long and well arched.

Legs and Feet.—*Legs :* Short thighs, moderately long and strong shanks. *Toes :* Four on each foot, and well spread.

Carriage.—Active and graceful.

Weight.—About 7½ lb.

HEN

Except that the *Tail* is carried somewhat low, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—From 5½ lb. to 6½ lb.

COLOUR

Beak : Horn. *Eyes :* Red. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Slate.

Plumage of the Cock.—*Head :* Red. *Hackle and Saddle :* Red, each feather marked down the centre with a stripe of black. *Back :* Red, spangled with black. *Wings :* Bow, rich red ; coverts, rich red, each feather ending with a black spangle forming a black bar across the wing ; primaries and secondaries, red, heavily tipped (at the ends) with black. *Breast, Under-parts, Tail, and Hangers :* Black.

Plumage of the Hen.—*Head and Hackle :* As in the cock. *Back and Breast :* Ground, deep red-brown, free from smuttiness, each feather tipped with a half-moon black spangle, the markings on the breast, back, and wings to be as uniform as possible. *Wings :* Primaries and secondaries as in the cock ; coverts evenly spangled. *Tail :* Black.

SCALE OF POINTS

Head : comb, 20 ; ear-lobes and wattles, 10 ; skull, 5	35
Colour and markings	20
Size	15
Condition	10
Type	10
Tail	5
Legs and feet	5
	100

Serious defects : Comb over to either side of the head ; white ear-lobes ; round back ; squirrel or wry tail ; feathers on shanks or toes ; other than slate coloured legs ; other than four toes on each foot.

CHAPTER XXX.

POLISH.

POLISH fowls were formerly called Polands, but the latter name was gradually superseded from a conviction that the birds had no real connection with Poland, and that this was a mere colloquial corruption of their "polled" or crested character. This is still the most probable hypothesis; though the recent discovery of races of fowls with crests and beards and whiskers throughout South Russia, has perhaps added somewhat more plausibility to a possible geographical origin of the name, than existed some years ago.

The chief outward characteristic of all Polish fowls is the crest; but this is connected with a craniological peculiarity still more remarkable and distinct, though not so evident to mere observation. It consists of a spherical protuberance at the top of the skull, generally pierced by apertures which are only covered by skin, and whose size is in proportion to that of the crest, so that the best crested birds can be known as soon as hatched, from the size of this protuberance alone. Excess in one part being often connected with defect in some other, as Mr. Darwin pointed out, the skulls with this peculiarity usually show a chasm in the intermaxillary bones, which in other fowls support the roof of the nostrils; owing to which deficiency in bony support the nostrils of all heavily crested fowls appear flattened and depressed, and yet cavernous in character. Fig. 129 is drawn from the skull of a Polish fowl in the Museum of the Royal College of Surgeons, and shows clearly both the bony protuberance of the skull, pierced by apertures, and the chasm in the bone over the nostrils. These peculiarities were misunderstood by the older naturalists; Blumenbach believing that they were rarely found in the cocks, while Pallas attributed them either to disease or a cross with the Guinea fowl; and even the late Professor Owen (in the catalogue of the Museum just mentioned) inclining to the idea of disease. The true nature of this peculiar structure, and its connection with the size of crest, were first clearly pointed out by the late Dr. Horner, in Wingfield and Johnson's *Poultry Book* of 1853.

Besides the crest, the majority of the Polish varieties now bred are furnished with abundant beards, and side-muffs or whiskers covering the cheeks, while in such birds the wattles have entirely or almost disappeared. These features have however been subject to changes of fashion and breeding in the history of the fowl. Not only is the present white-crested Black variety still wattled and beardless, but before the era of poultry-shows the Spangled breeds in England were the same, and the late Mr. John Baily has left it on record that the first bearded specimens, then called by him and other dealers "Muffeties," were not regarded as true. The late Mr. Baker is believed to have been the first importer of bearded specimens, and supported them; and this type finally prevailed in all but the white-crested breed. There is one more peculiarity of the race, in a two-horned or double character of the comb. This is sought as small as possible, and is in most specimens almost invisible; but however rudimentary it may be, the double character can be discerned; and in allied breeds like Crêves and Houdans the double development becomes very marked. This general tendency to development of bifurcation in comb, protuberance in skull, beards, and whiskers, in combination with large crest, is remarkable as the type of a race which has profoundly impressed the poultry of France, Holland, Germany, and Russia.

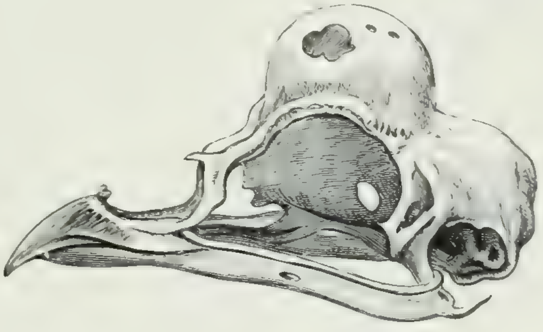


Fig. 129.—Skull of Polish Fowl.

Polish fowls may be regarded generally as non-sitters, but exceptions are rather more numerous than with some other non-incubating breeds. They are good layers of large white eggs; but the bulk of these are usually laid between February and the moult, and they are not as a rule good winter layers, though they have proved so if given proper diet, with adequate care and shelter. The flesh is tender and juicy. Most strains must be pronounced delicate, and specially susceptible to colds if allowed out in the wet with the crests in natural condition, as these retain the moisture. Some breeders however report differently in this respect, and by treatment of the crests this difficulty may be overcome. There is however, owing no doubt to the scarcity of breeders, some undoubted weakness of constitution, in addition to this, leading to a special frequency of crooked backs and wry tails, which are more common in Polish than in any other breeds. The chickens are very apt to droop at a month to six weeks old, while fledging, and at such times require special support and a little coddling, which is more effective than meat or stimulants, though these are useful in moderation, especially a little chopped cheese and sunflower-seed. On the whole, Polish are best suited for limited grass-runs, with ample shed-room in which they can be confined. In such circumstances they thrive well if properly attended to, and quickly become exceedingly affectionate and tame.

Qualities and Management.

One or two points of practical management require attention. The birds should if possible be always driven in out of the rain, or at least of any heavy rain, though this is not quite so necessary when they are treated as presently mentioned. Even then, however, this remains the most vulnerable point in regard to health. The fountain should have a very small opening, in which the bottom of the crest cannot get wet. When moult approaches, care should be taken that the birds do not peck each other's crests, which they are very apt to do in the young quill stage, especially that of the cock, who will stand still as if he enjoyed it, while his hens pick every quill out. It is much the safest and best to put him in a compartment by himself till his crest be grown. Both at the moult, and as the bird grows the crest in chickenhood, the horny sheaths of these feathers should be attended to. Fowls preen the rest of their plumage themselves, thus removing the dry sheaths at the proper time, and leaving the feather free to expand; but the crest they cannot reach, and it is necessary at the right time (not too soon) to remove the dry sheaths of the crest feathers with the thumb-nail.

Polish should not be hatched very early, or late. April is a good month, and at this period the chickens usually thrive well if on dry soil. Early-hatched ones often perish, and late-hatched ones hardly ever grow good crests. The latter are only found on birds that have thriven from infancy, and are generally last of all to moult out perfect. The size of the crest, if it grows favourably, can be seen from that of the little downy poll.

Polish are not practically used for crossing; but almost the whole range of French poultry proves their value in this respect, the Houdan and Crêve and many other breeds being mainly of Polish blood. We happen to know that a direct cross with the Dorking produces a fowl with delicious flesh, which is a good layer, and is also hardy, but very variable in appearance.

Proceeding now to treat of Polish as exhibition fowls, it is deeply to be regretted that this handsome race should have declined in popularity to an extent only paralleled by the case of the Spanish. Very rarely at shows are any classes at all now provided for them, whereas from 1850 to about 1865 the Polish classes were amongst the best filled, and most of the known varieties were occasionally met with. At the Birmingham show of 1855, Gold and Silver Spangled and Laced, Buff Laced, Lead-coloured (blue or Andalusian), White-crested Whites, Black-crested Blacks, Yellows, and Greys were represented, many of which are now forgotten. Unfortunately the present scarcity of breeders tends to perpetuate some of the evils already mentioned, and has caused some obvious deterioration in several respects: in fact many specimens show the obvious need of fresh blood. This can readily be procured from the Continent; and Polish are also popular and well supported in both the United States and Canada; several breeders at London, Ontario, in particular, exhibiting specimens in the United States as well as their own country, which have challenged admiration.

This popularity in a severe climate is remarkable, and we think it probable that the maintenance of Polish under such circumstances may be due to management of the crests. Years ago these were simply left on, not only with consequences and difficulties to which we have alluded, but to the great detriment of fertility as well, which may have partly caused the great decline of Polish fowls in England. The trouble of keeping the crests clean is considerable, and the birds being often unable to see, are sometimes so startled that they may even die from shock, while many eggs prove barren. The more skilled fanciers of to-day adopt expedients to prevent this; and in England it has been the custom to cut off the crests of both sexes after exhibition is over, in the case of laying and breeding stock. The American plan is more usually to tie up the crest, which is also often done if required to get it into better shape, or more perfect symmetry; as, for example, if it tends to grow one-sided, or open in the centre. Sometimes two or three small india-rubber bands will keep the crest together and out of the eyes: sometimes it may be quite bandaged up in narrow tape: more usually threads are passed round and through as required, by the help of a needle—not of course through the quills. The crests are often tied up even for a railway journey. In one or other of these ways, unfertile eggs and irregularity of feeding may be avoided.

The varieties of Polish generally recognised at present are white-crested Blacks, Gold and Silver Spangled, and Chamois or Buff Laced. Others can only receive mention.

White-crested Black Polish.

The White-crested Black Polish is tolerably uniform in size, the finer specimens usually reaching about 6 lbs. in the cock and 5 lbs. in the hen. Our own opinion is that it is usually the most delicate of the varieties; but Mr. Peter Unsworth, who bred it many years, reported it as hardy even in a wet and damp situation. The body is neat and compact, with fine bones and a flowing tail in the cock; and the carriage, as in all Polish, may be best described as suggestive of foppishness in the cock, and inquisitiveness in the hen. The plumage of the body is glossy black, of the crest pure white, except that there are always a few black feathers, the fewer the better, in the front over the nostrils, which it is a pity are not mentioned in the Standard, as they are always there unless trimmed away. The face is smooth and red, wattles rather long and red, ear-lobes small, round, and white, beak dark, legs dark blue or nearly black. The comb should be practically absent, but on close inspection two very small horns can generally be discerned.

In breeding this variety, the chief point is to get birds with as good crests as possible on both sides, as regards both size, shape, and colour, in which is included snowiness of the white, and the fewest black feathers. If some choice has to be made of defect, a good large crest in the cock is of more importance than in the hen. A single mating will breed both sexes alike good, if the parents are satisfactory; though of course if a good-crested cock is mated with hens not so good, more well-crested cockerels than pullets are likely to be produced.

The same remarks apply to the White-crested Blue Polish.

Gold and Silver Spangled Polish.

Spangled Polish are bred in two colours, Silver and Golden, in which alone their difference consists. The Gold would appear the oldest and strongest strain, as a great many instances are recorded of Silvers breeding Golden specimens, while we can remember hardly any case of Golds breeding Silvers. Golds and Silvers have been crossed by many breeders at different times, the produce being almost always distinct Gold or Silver, without weakening of either colour. Notwithstanding this evident community of blood, the Silvers exhibited have as a rule been larger than the Golden, though some very large and fine Golden Polish have been exhibited by the late Mr. Joseph Partington * on various occasions;

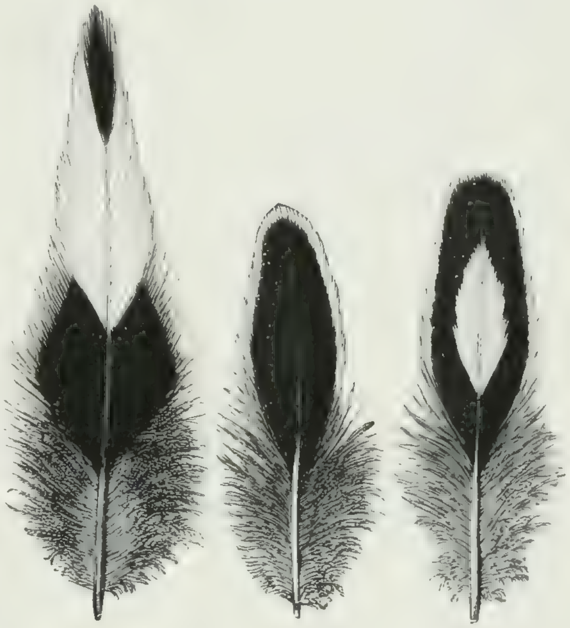

Cock (Young). Hen (First Year). Hen (Second Year).

Fig. 130.—Crest Feathers, Spangled Polish.

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* Mr. Partington had kindly undertaken the article on Polish for this work; but his death in the summer of 1901, deeply regretted by many for other reasons, suddenly deprived us of his valuable aid in that manner. This article is written partly from details gathered from him at different times; partly from some notes kindly sent by the Rev. Godfrey J. Horner of York, son of the late Dr. Horner; and partly from a few notes or comments made on his former articles by the late Mr. Henry Beldon.

even these, however, were scarcely equal in size to the largest of his Silvers. Some of the latter we know to have reached as much as 8½ lbs. in cocks and 6½ lbs. in hens.

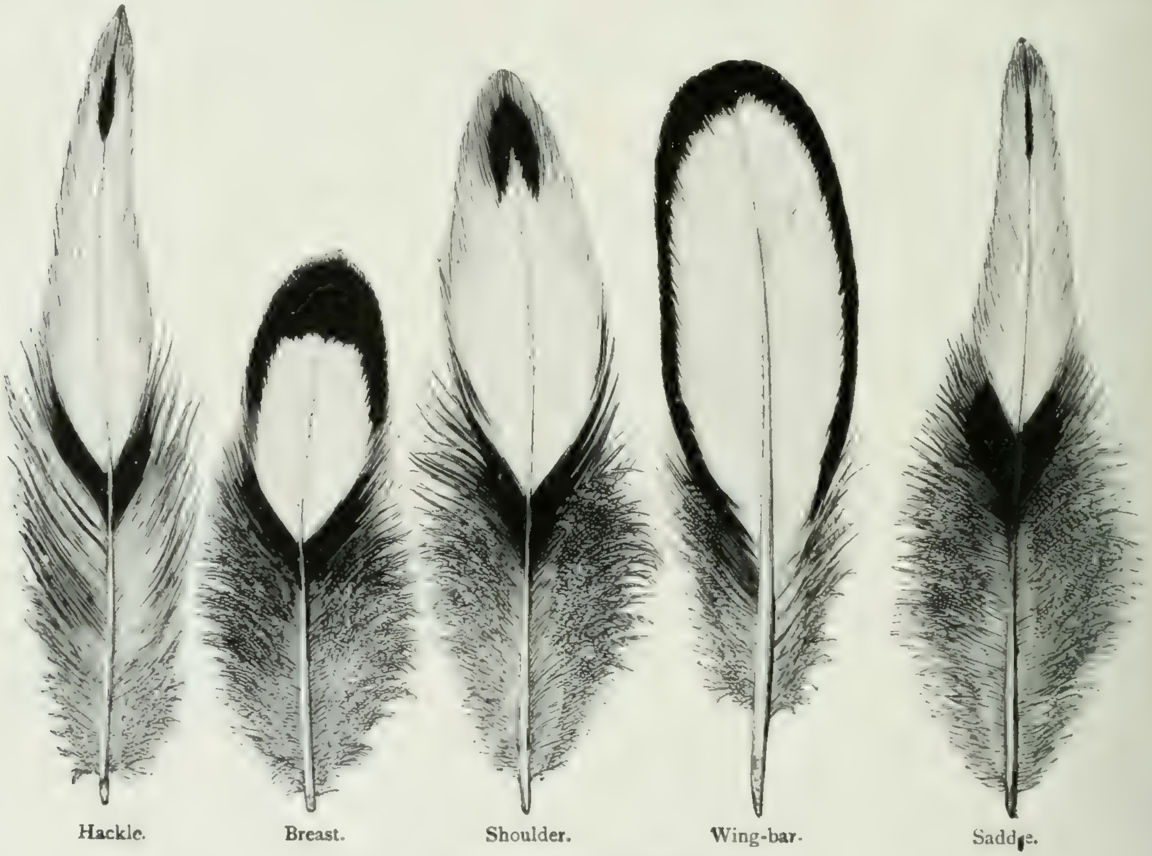
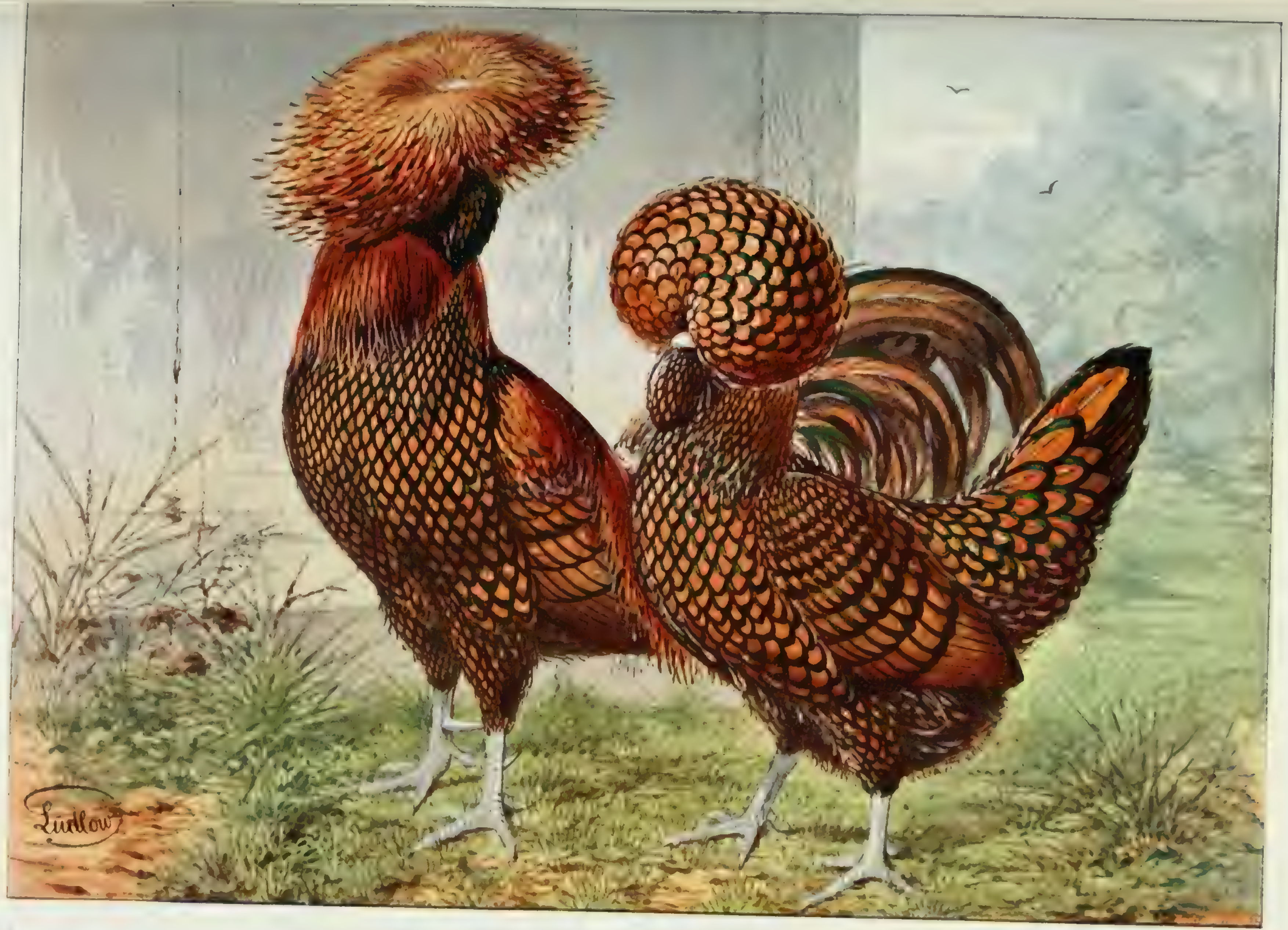


Fig. 131.—Feathers of Silver Spangled Polish Cock.

The crests of both Spangled varieties are relatively larger than in the White-crested Black, and that of the cock generally spreads more open; but it is desired as free from any hollowness or "pancake" formation, and as full and round on top, as possible, rising well up in front, and falling down towards sides and back with no split or division. It has already been intimated that beardless Spangles were first known in England, and these were more on a par with the Blacks in point of crest; but with the bearded race came great improvement in this respect. Taking the Silver for example, and simply substituting a golden ground for silver in the other breed, the crest-feathers of the cock somewhat resemble hackles in structure, and are black at the base, white in the middle part, and tipped with black at the ends (Fig. 130), the white however increasing with age. That of the hen should be filled up as round as a ball, and also changes with her age. The first year it is black in the centre and edged with white, the width of this edging differing with the heaviness of marking elsewhere; but after moult the centre becomes white, with a heavy lacing of black (Fig. 130), and later this may be edged with white, the crest getting lighter, with perhaps some quite white feathers, as the bird gets older.

In regard to the rest of the plumage there have been considerable changes. The birds first shown were spangled with round *spangles* all over, except on the wings, which were always more or less laced; the remains of this marking being seen in the hackles to-day. But this spangling was never so perfect as in Hamburghs, and the superior beauty of laced marking soon brought it to the front, where it has remained the accepted standard ever since. The beard of the cock should be thickly laced, or very dark: his hackles and saddle feathers tipped with black; the shoulders more heavily spotted, but with a notch showing some little approach to lacing; the feathers of the wing-bars almost



GOLD SPANGLED POLISH.

perfectly laced, and the breast a broader lacing of more crescentic character, but still going round the feather. The cock feathers are shown in Fig. 131.* His secondary quills should also be well laced round with black. The true tail-feathers are supposed to be white, edged with black, but are more usually a bit peppered or grey, with more tipping at the ends than lacing at the sides; the sickles also should be edged with black with a thicker end or splash, or sort of spangle, and these also are usually more or less grey inside the lacing. These darker-tailed cocks make the best breeders.

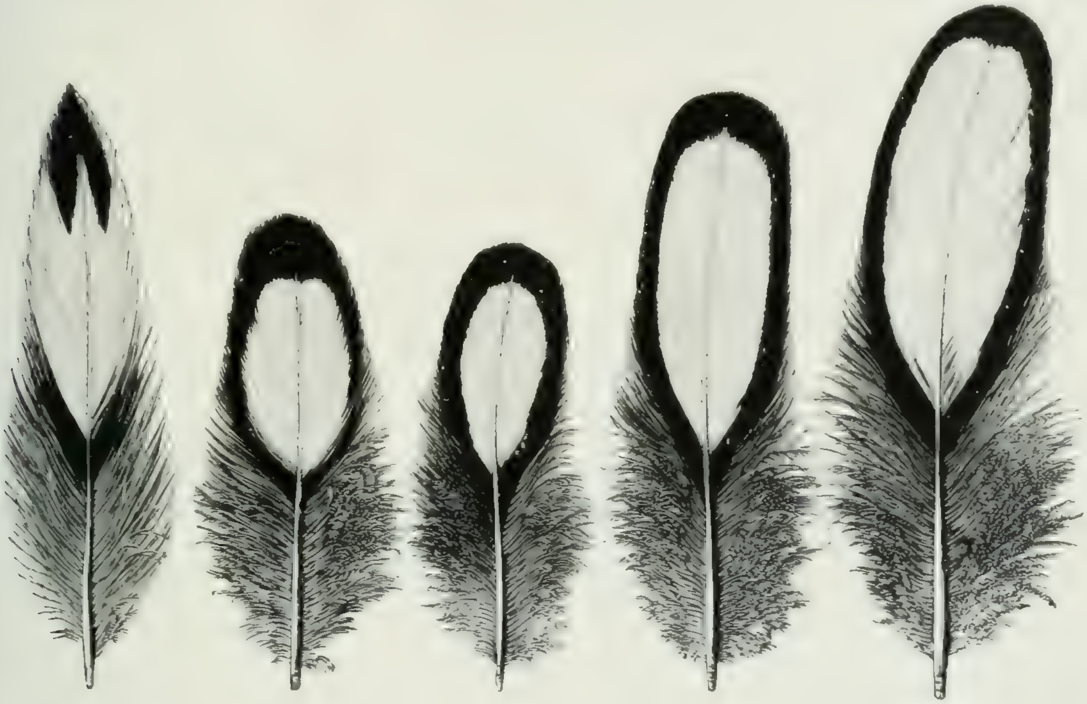

Hackle.
Breast.
Wing-bow.
Wing-bar.
Tail-covert.

Fig. 132.—Feathers of Silver Spangled Polish Hen.

The beard of the hen should be full, and well marked with black, but is not so very dark as in the cock. The neck-hackle should be well tipped with black, the tipping being a kind of semi-lacing: the breast heavily laced, thicker at the tips of the feathers, but less crescentic in character than in the cock; the wing-bow, bars, and tail-coverts rather heavily but more evenly laced, though the marking is almost always rather wider at the tips of the feathers. Her secondaries are very evenly laced, and the tail-feathers should be well edged, with a thicker crescentic spangle at the tip, and as clear as possible, though here also there is generally a little pepper or grey. The hen's feathers are shown in Fig. 132.

The ground-colour of Silvers should of course be as silvery as possible, and demands the same careful selection in breeding, and care to preserve it, as other white breeds. In Golds the colour of the cocks is a deep golden bay on the breast, and more reddish bay above*; that of the hen a golden bay. The legs of both varieties are a dark or slaty blue, and the beaks dark horn or dirty blue.

Breeding Spangled Polish.

In regard to the breeding of Spangled Polish, we have to consider the probable causes of the change or deterioration in marking—whichever it be termed—which has undoubtedly taken place during the last fifteen years. At show after show which we have visited, we have found the Spangled Polish (when there were any at all) very fine in crest, except for too much openness of centre in the cocks, but with obvious return to very poor spangling on the breast, instead of the true lacing which is recognised as the correct type. We could understand deliberate preference for really good round spangling; but the marking here referred to has not been that; it has been very poor, irregular, imperfect tipping of the feathers, not even a regular crescentic spangling, and every breeder whom we have asked, has admitted it as a fault. No doubt this has partly been due to lack of breeders, and consequently of blood, and of any encouragement at poultry shows. But the reason is far more to be found in the too great disregard of marking, and practically matching birds together *solely for crest.* This may have been a necessity, since crest has been the chief point in judging. But good lacing is never an easy marking to breed; and if it be really neglected in competition with some other point, it must inevitably suffer, as it has done here. The need of care, and the evil which may follow any return to a bad spangling, is curiously illustrated by an experience related in a letter to us from the Rev. G. J. Horner. The Golden Polish that came to him from his father, the late Dr. Horner, were spangled, Dr. Horner preferring that style. These birds soon gave him offspring *devoid of all marking*, so that he had some difficulty in breeding the stock up again. Such a result shows clearly the necessity for keeping up a really good and correctly laced marking.

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* These figures have been reproduced from Mr. Beldon's feathers of 1872, for the simple reason that we have been unable to find any even so good at the present day. The reasons for this deterioration have partly appeared already, and are further discussed in the remarks following.

* We think the Standard deficient, in not describing or recognising this more reddish top-colour.

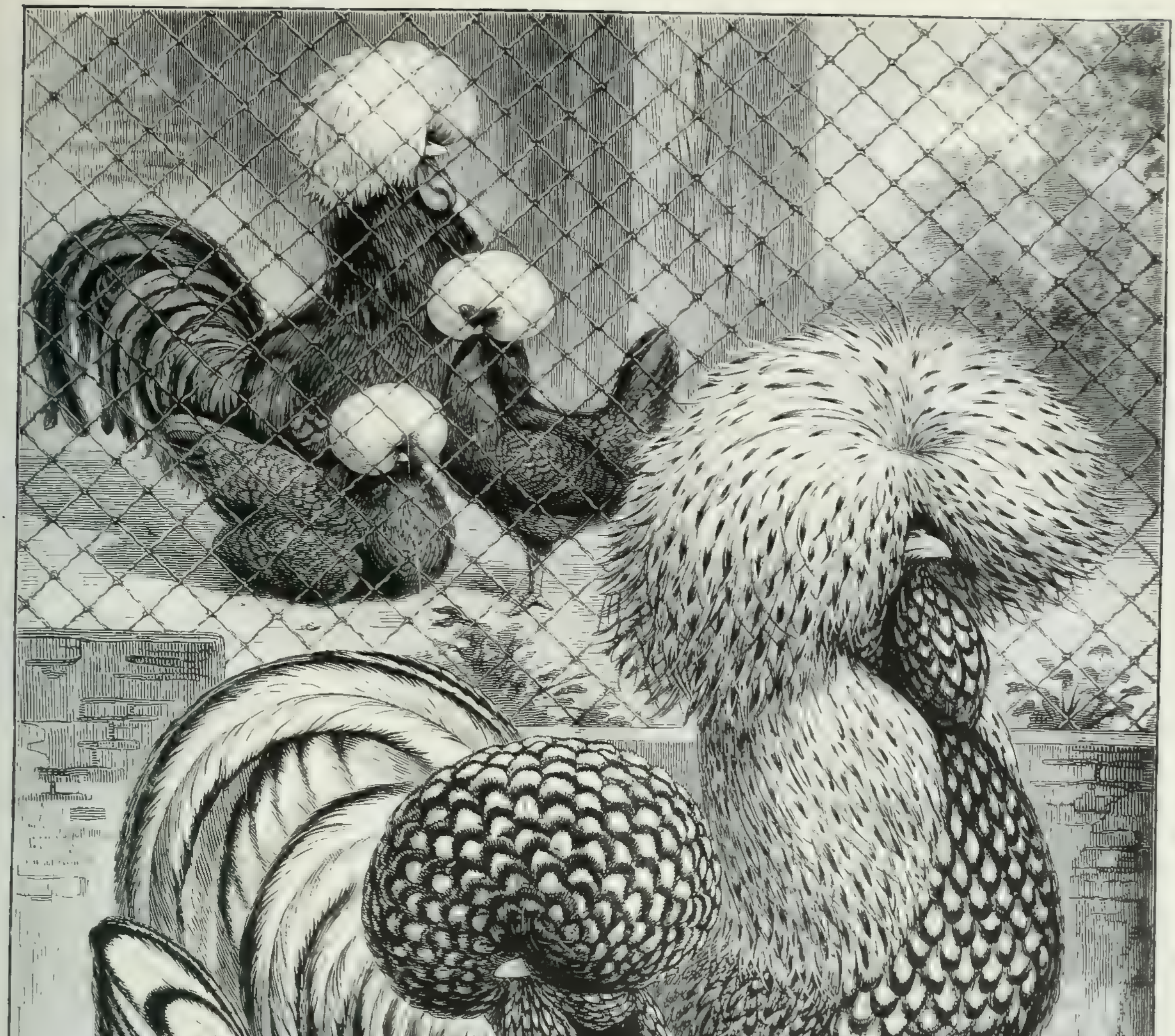
Good crests must of course be selected, especially in the cocks, and crest may also be cultivated to some extent by breeding only from old birds on both sides, a plan pursued by the late Mr. Sylvester. But if Spangled Polish are ever to reach again even the standard of marking formerly attained, more care *must* be bestowed upon lacing in comparison with crest; the standard of perfection being the Chamois variety next mentioned, which in accuracy and beauty of marking is far superior. Birds must be selected whose lacing is sharp and cleanly cut, and as even as possible all round the feather; and in particular, cocks whose breast-feathers do not run out of lacing up the sides. Slightly dark markings are generally to be preferred, as in other cases, except that birds with the narrowest tipping in proportion to the lacing at the sides of the feather, should be specially valued. As a rule a cock with rather grey or peppered tail, breeds better laced chickens than a white-tailed one. There is no necessity for mating up two pens. While old birds on both sides generally breed the largest crests, a cockerel very often breeds the largest and most vigorous chickens.

Newly hatched chickens of the Spangled breeds are a smudgy grey or smudgy brown respectively, the darker ones being usually the best marked when moulted out. The first or chicken feathers are very indistinct and patchy, and it is only in the full plumage that the character and beauty of the marking can be seen. Except in the gradual appearance of more white in the crests, the plumage generally improves with age for at least several years.

Chamois or Buff Laced Polish.

Another most beautiful variety, obviously allied to the Golden in the same way as Piles are allied to Black-breasted Red Game, and probably produced originally, though generations ago, by crossing Golden Spangled with White, is known as the Chamois or Buff Laced Polish, in which the black lacing is replaced by white, but of much greater sharpness and perfection. In regard to the points and breeding of this variety we need add nothing to the following article, kindly contributed by Mr. R. Gordon, Cheviot Cottage, Leven, N.B., but we would call special attention to what is there stated regarding its hardiness. This is a striking proof of the difference between strong foreign blood, nourished by stock widely prevalent, and some present worn-out strains of Polish. The beauty and perfection of the lacing is also a proof that care for *all* the points, instead of breeding for crest alone, produces the best result in the end, even from a fancier's point of view.

"All varieties of Polish are beautiful, but the Buff-laces are truly visions of loveliness. Imagine the cock, a noble upstanding bird, crowned with a voluminous but symmetrical crest, and with ample muffling on cheeks and throat; a well-curved neck clad with lustrous plumage of orange-buff hue; back and wing-bow a shade deeper in colour, and saddle matching the hackles of the neck. Side hangers and tail rich buff, each feather sharply margined with white. Breast, wing-bars, and fluffy feathers at side of thigh all rich buff, every feather narrowly but most distinctly laced with pure white. The whole plumage of the hen is one uniform shade of orange-buff, every feather from crest to tail being laced with white. In the cock the crest is solid buff, but in the hen is fully laced, and is always at its best the first year. Comb and wattles are almost rudimentary in both sexes. Legs are clear blue, and beaks of a light skin colour. Add to this a sprightly gaiety of movement which seems to characterise these fowls when at liberty, and it can well be imagined that when disporting themselves on a greensward a picture of surpassing loveliness is presented to the beholder.



WHITE-CRESTED BLACK

SILVER SPANGLED POLISH

"When I first took up the breed a year or two ago, I had to go to Holland for stock, being unable to find the names of any breeders of the variety in this country. A prominent Dutch fancier selected the best pair at the Amsterdam Show for me, and afterwards I was fortunate in getting some birds of a strain which had been imported into England from Hanover. Breeding carefully and on scientific lines from these two distinct stocks, I am able to confidently offer the following remarks on the propagation of the breed.

"First of all, as to the shade of buff. If we select a light buff, then there is not sufficient contrast between the lacing and the ground-colour, and much of the beauty is lost. If we encourage a very dark buff, then the white lacing takes on a brown tinge, and again much of the beauty is lost. The latter class of hen also throws cocks with an almost red top-colour. The true shade to be sought after is undoubtedly a rich orange-buff, which takes and maintains the white lacing in undimmed purity.

"As to the lacing, we must adhere to a sharp, narrow, but very distinct character, partaking somewhat of the Sebright type. If the white lacing is too broad, then the feathers of the breast and elsewhere, which overlap each other, will show little else than masses of almost unbroken white, especially on breast and cushion. But on the other hand, if we keep to the clear, narrow type, the balance of ground-colour and lacing is maintained in most harmonious proportions, and all the beauty of a rich contrast is visible under every condition.

"It is not necessary to breed the sexes from different pens; one mating is sufficient. The male bird should conform to the colour and type previously described, but if he is just a trifle on the deep side as to colour, so much the better. It is imperative that he should have been bred from a sound-coloured, well-laced hen; a male bird bred from a pale-coloured, washy-looking hen, although of good colour himself, will throw nothing but inferior stock. The hens selected for breeding purposes should be of good, sound, medium colour, all very clearly laced. The crests of the females should be as large and globular-shaped as possible, and that of the cock should not be straggling, and especially not falling over the front of his face. The length and weight of some of the feathers in very large crests inclines them to a drooping condition, but the general tendency is a clear rise up from the front, and a graceful backward sweep.

"When mating up a breeding pen, it is most desirable to cut the crests completely off the whole of the birds, as well as some of the muffling round the eyes. They can then see to feed and forage properly, and the hens are not startled by the sudden attentions of the male bird. The result is very few, if any, unfertile eggs; but should this precaution be neglected, the opposite may be the case.

"After the first year both sexes throw a few whole white feathers in crests. This is characteristic of the breed, and, I am of opinion, can never be greatly modified; but indeed it is no drawback to the appearance of the birds. It is merely Nature's intimation that the fowls are over a year old.

"While the tails of the females are generally sound-coloured, those of the males are sometimes not quite so good. The white lacing is inclined to run occasionally into the web of the sickles and lose its sharpness of character, and especially is this so with males of over one year old. Careful mating will, however, go far to control this.

"The Buff-laces are of true Polish blood, and breed to type and colour with almost unfailing fidelity. I have only known one bird which threw a chicken not a buff-laced, and that was a hen which occasionally threw a golden-spangled sport. I dispensed with both her and her progeny, although it was no sign of impurity, but merely the flickering acknowledgment of the influence of a long-distant Golden Polish ancestor. It is well known that a cross of two entirely unrelated strains of almost any breed of poultry, generally throws chickens of anything but standard quality. But when I crossed such widely different strains as the Dutch and German ones previously mentioned, I got scarcely a single weed as the result. The majority were finer in size, colour, lacing, and vigour than either parent. This undoubtedly goes to prove that so firmly fixed in the Buff-laces is the true old prepotent Polish blood, that the law of reversion is practically inoperative, when stocks of untainted purity and long descent are selected. At the great Paris Show there are always to be found many lovely specimens of the Polish breeds, and conspicuous among these is the large proportion of Buff-laced birds usually shown. At the 1897 show especially the Buff-laces were very numerous. They were the admired of countless observers, and it is doubtful if the cock which took premier honours, the property of the Comte de Lainsecq, could be surpassed. Everything was there: size, carriage, shape, crest, colour, and lacing; he stood a king among his peers.

"With regard to utility qualities, the hens are good layers of white-shelled eggs from about the beginning of February to the middle of

September. The eggs are not only large for the size of the fowls, but they are really large eggs when produced by birds over one year old. I have not found the hens to be very good winter layers, but I never put them on special diet for that purpose, and have no doubt that if they were specially treated for egg-production at that season, they would yield a fair return. As table fowls they are of fair size, fine shape, and carry a goodly quantity of breast meat of most excellent flavour and quality.

"I have sometimes read that Polish fowls are delicate. I suppose some people must have found them so, but surely the Buff-laces are not included in this category. My whole experience of them is in the contrary direction. I bred Silver Wyandottes and Indian Game for many years, and when I say that my Buff-laces have proved hardier than either of these, I state no more than the bare truth, and need say nothing further on this subject."

Other Varieties.

Many other varieties of Polish have been seen at different times, and some of them may still be found on the Continent. The *White*—all white—variety is a large and fine bearded race of fowls, but we have seen none in England since about 1880. The *Black-crested White* was said to be even larger, and probably the largest of all; this was also bearded and heavily crested, but is believed to be now extinct everywhere, as many inquiries on the Continent have failed to bring to light any survivors. The colour has been approached by several manufacturers, but the fowls thus produced were far beneath the size and character reported of the old breed. *Black* Polish have been shown in England years ago, and a few years since were reported at a Paris show: these were beardless, and rather small. The *White-crested Blue* is a recent Continental importation, though it was bred in England forty years ago, and is obviously connected with the Black variety. *Cuckoos* have been shown several times, but are not pleasing: abroad they are somewhat more often seen. The French have a variety they call *Ermine*, which is a white picked out with black very much after the colour of a Light Brahma: this colour ought to look very attractive when in good condition. *Buff* is another Continental variety not particularly rare. The original *Poultry Book* of 1853 also mentions a black and white speckled breed, and a grey or grizzled variety with heavy crests and beards, and in plumage resembling that of Silver-pencilled Hamburghs, but rather less clear than in the latter—probably very like that of the Campine. Neither of these last has been seen by English eyes for many years.

Judging Polish.

In judging Polish, fulness and good shape of the crest should be reckoned of as much importance as the size of it, and the present greater prevalence of the "pancake" style in cocks, is owing to neglect of this consideration. Any of those malformations of body which are so frequently found in this breed, should be vigilantly looked for, and if found, of course entail passing over. In regard to colour and marking, the Standard no doubt lays enough nominal stress upon these points, though we fail to understand how colour can be valued at 30 in Blacks, and colour and markings together only 25 points in Spangles, wherein these points are so much more important. But it is quite certain that in the Spangled varieties, more stress *in practice* needs to be laid upon the quality of the lacing than has for many years been the case, and that a more uniform width, as in the Chamois or Buff Laced, should be required.

There is little danger of trimming except in the white crests of the Black variety, and in the combs, which if so large as to be very evident, are often amputated.

The Standard of Perfection, as drawn up by the Poultry Club, is as follows:

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Large, with a decidedly pronounced protuberance on top, and crested. *Crest:* Large and full, circular on top, and free from any split or parting, high and smooth front, compact in the centre, falling evenly with long, untwisted or reverse-faced feathers far down the nape of the neck, and composed of feathers similar to those of the hackles. *Beak:* Of medium length, and having large nostrils rising above the curved line of the beak. *Eyes:* Large and full. *Comb:* If any (preference should be given to Polish, minus a comb), of the horn type, and very small. *Face:* Smooth, and without muffling in the White-crested varieties, and completely covered by muffling in the others. *Muffling:* Large, full, and compact, fitting around to the back of the eyes and almost hiding the face. *Ear-lobes:* Very small and round, but quite invisible in the muffled varieties. *Wattles:* Rather large and long in the White-crested varieties; the others are minus wattles.

Neck.—Long, and with abundant hackle coming well down on the shoulders.

Body.—*Breast:* Full and round. *Back:* Fairly long and flat, tapering to tail. *Flanks:* Deep. *Shoulders:* Wide. *Wings:* Large, closely carried.

Tail.—Full and neatly spread, and carried somewhat low, not perpendicularly, the sickles and coverts abundant and well curved.

Legs and Feet.—*Legs :* Slender and fairly long, and the shanks free from feathers. *Toes :* Four on each foot, slender, and well spread.

Carriage.—Sprightly and erect.

Weight.—6½ lb.

HEN

With the exception that the *Crest* is of globular shape, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—5 lb.

COLOUR

THE CHAMOIS OR WHITE-LACED BUFF

Beak : Dark blue or horn. *Eyes :* Red. *Comb and Face :* Red. *Ear-lobes :* Blue-white. *Legs and Feet :* Dark blue.

Plumage of the Cock.—Buff ground with white markings. *Crest :* White at the roots and the tips, and as free as possible from whole white feathers. *Muffling :* Mottled or laced, not solid buff. *Hackle :* Tipped. *Wings :* Bar and secondaries laced, and primaries tipped. *Tail, Sickles, and Coverts :* Laced.

Plumage of the Hen.—Except that the wing primaries are tipped, the colours and markings, including the crest, are buff ground and white lacing.

THE GOLD

Head points, Legs and Feet : As in the Chamois.

Plumage of the Cock.—Golden bay ground, with black markings. *Crest :* Black at the roots and the tips, and as free as possible from whole white feathers. *Muffling :* Mottled or laced, not solid black. *Hackle :* Tipped. *Back and Saddle :* Distinctly laced, or spangled at the tips. *Breast, Thighs, Shoulders, and Wings :* Laced, except primaries, which are tipped. *Tail :* Laced, the ends of the sickles being well splashed.

Plumage of the Hen.—Golden bay ground with black lacing, each feather being distinctly marked, and as free as possible from splashes.

THE SILVER

Head points, Legs and Feet : As in the Chamois.

Plumage.—As in the Gold, substituting silver as the ground.

THE WHITE

Beak : Dark blue. *Eyes, Comb, and Face :* Red. *Ear-lobes :* White. *Legs and Feet :* Dark blue.

Plumage.—Pure white.

THE WHITE-CRESTED BLACK

Head points : As in the White. *Legs and Feet :* Dark blue or almost black.

Plumage.—*Crest :* Snow white. *Remainder of Plumage :* Rich metallic black.

THE WHITE-CRESTED BLUE

Head points, Legs and Feet : As in the White-Crested Black.

Plumage.—*Crest :* Snow white. *Remainder of Plumage :* Solid dark blue.

SCALE OF POINTS

WHITE-CRESTED VARIETIES

Head : crest, 30 ; comb and wattles, 15	45
Colour	30
Condition	15
Type	5
Size	5
	100

OTHER VARIETIES

Head : crest, 30 ; muffling, 10 ; comb and wattles, 5	45
Colour and markings	25
Type	10
Size	10
Condition	10
	100

Serious defects : Split or twisted crest ; other than horn comb ; absence of muffling in Chamois, Gold, Silver, and White varieties ; foul-coloured plumage ; legs other than blue or slate ; other than four toes on each foot ; wry tail : any deformity.

CHAPTER XXXI.

FRENCH BREEDS OF POULTRY.

FRENCH breeds of poultry were at one time supposed to be the chief cause of the large exportation of French eggs, and the fine quality of French table fowls; and under the influence of this idea Mr. Geyelin and the disastrous National Poultry Company which he originated, made great efforts to introduce French breeds into England. The error of these opinions was speedily discovered; but after setting all such exaggerated hopes aside, several French races have been found distinctly valuable, and are valued in England at this day. Some are of pretty old standing; others are almost of yesterday's manufacture; and the remarkable fact about nearly all of them is, that except a few of the more recent, which have owed their origin to stock imported from England, and even including one or two of these, the greater part show by their crests, or muffling, or bifurcated combs, more or less of a common parentage in the Polish race, and appear to owe their thin skin and delicate flesh mainly to this ancestry.

Houdans.

The best known in this country of the French breeds is the Houdan, which was briefly mentioned by Messrs. Wingfield and Johnson in *The Poultry Book* of 1853, as the Normandy fowl, and fully described by Mr. Geyelin in 1865. The economic value of this breed is very great, as it is very hardy, a quick grower in chickenhood, when well bred a first-class layer of good-sized eggs, and of very delicate flesh, with a tendency to fatten well. The male birds are also unusually vigorous and fertile, many of them requiring more hens than would be usual with other birds of the same size.

The Houdan cock should be as large as possible, the adult being 8 lbs. or 9 lbs. or more. He has a good-sized crest rather inclining backward, and a peculiar comb, resembling the open leaves of a book with a sort of mulberry in the centre, or a butterfly with open wings. This is large in the cock, but rather small in the hens. The wattles are moderate and rounded, beard and whiskers rather full. The neck-hackle is full and thick, the body very long and deep in keel, carried in a very sturdy manner, the tail full in sickles. The legs are clean, pinky white mottled with black in colour, and five-toed; the plumage black and white mixed, of no exact pattern, but about equally broken in colour when adult, and rather more black than white when young; usually more or less approaching a crescentic white marking on beetle-green centre, over the breast and body. The hen has a fuller, globular, and very Polish crest, with much smaller comb, her weight 6 lbs. or 7 lbs.

For the following remarks upon breeding and exhibiting Houdans, their progress in England, and present qualities, we were indebted to Mr. S. W. Thomas, Glasfryn, Forest Fach, Swansea, whose long connection with the breed, and success as an exhibitor, are well known.

"I had my first Houdans in 1874, and from then till now I have bred them regularly and in large numbers. One or two of those I first had were imported birds, that had done some winning in France, but these were too old to be prolific. My unvarying experience during the many years I have kept and bred them—and I have always bred for exhibition—is that Houdans are very good layers of very large eggs, and as table fowls are not to be beaten. Of course I have always selected the finest and the healthiest stock-birds. Indeed, otherwise it would be quite impossible to breed up to the necessary size for exhibition.

"Since 1874 there have been some changes of the fashion in colour of Houdans. Mr. Dixon (then, and till he retired, the favourite and best judge of Houdans) rather favoured the lighter-coloured birds, about the years 1874 and 1875, I think. A couple of years or so previously, very dark birds were in fashion. Probably Mr. Dixon's action in favouring the lighter ones was to modify the tendency to the very dark birds then so frequently shown. At any rate, if that was the case, he succeeded, because very dark birds have never been in fashion since. Breeders began at once to aim at a medium, well mottled, or broken colour, and at the present time they have succeeded, because now a bad-coloured bird in the show-pen is quite the exception. Twelve or fifteen years ago very light and very dark birds were not infrequently to be seen in the same prize list at the big shows.

"In comb and crest we have made great strides, and now a bird with inferior head points is seldom exhibited. The spiral crest is gone, and so is the Crêve comb. Twenty years ago a leaf comb was quite the exception, and a smooth well-formed crest rarely seen. In size we have hardly increased on the very finest birds of years ago, but I think we have a far better average, and probably the best young Houdans this last year or two were larger than any of similar age shown in past years. No breed develops more in size and furnishing with the first adult moult. This also applies to Crêves. I say no breed; by that, of course, I mean no breed with which I have had experience, though I may say that at one time or other I have kept most sorts.

"Houdans develop quickly, and cockerels at six to seven months are usually in full feather; pullets at from five to six months, at which time they generally commence to lay. They fatten very quickly, and if over-fed about this age it retards their laying. They stand confinement capitally; indeed, exhibition birds do better if confined during the show season than if allowed to run out.

Points in Breeding Houdans.

"In breeding Houdans, I may at once remark that both sexes of the highest excellence can be bred from the one pen. No need, in Houdans at any rate, of one pen for cockerel-breeding and another for pullet-breeding. In breeding for exhibition birds, nice medium-coloured birds should be selected, the black a good solid green-black, nicely broken. They should have full crests, as smooth—especially in front—as possible, and neat, even combs of butterfly pattern. The comb may vary in size and shape, just as the wings of different sorts of butterflies do, but the shape and pattern of the comb must be the butterfly, with the wings open, or nearly so. They should have light or whitish legs and feet, mottled with blue or blackish blue. If the white is a pinkish white, all the better. If a pen of birds of this description, with good deep square bodies and of a good strain, be bred from, they are pretty sure to produce a good proportion of chickens fit to show. Some chickens come with very dark or nearly black legs. These usually are very dark in plumage, but not invariably so. These black or dark legs always change with age to blue or bluish mottled colour, and though the black or very dark leg is much against a bird in the show-pen, the blue or bluish mottled colour is very little detriment indeed to it, and such birds frequently win the highest honours. Those who happen to have dark birds or light birds of much excellence in Houdan character and points, and who wish to breed from them, must select light hens for a dark cock, or, which I much prefer, a light cock for dark hens. Mated in this way, a fair proportion of good coloured chickens will be the result. Any foot deformity in the stock birds is very likely to be perpetuated, and whether these be dark, light, or medium colour, let me repeat that the black in the plumage must be a good sound green black.

"Two-year-old birds are best to breed from, as the produce have greater robustness and usually attain greater size; but year old cocks mated with two and three year old hens give excellent results. Singular to say, the largest hen I ever bred was from a pen of pullets mated with a two-year-old cock; but I should not expect this result to be repeated. Houdans are long lived. I have several times shown cocks up to five years, and hens up to six and seven years, and on one occasion I bred from a cock five years old, and he bred freely and well in March, and this, too, after a fairly long show career.

"As regards the economic value of Houdans, it might be supposed that the larger-crested birds were less prolific than the smaller-crested birds. I have not found this so. The best laying Houdan I ever had—and she really was a wonderful layer—was a very large bird with an enormous crest, and with an almost imperceptible comb even when laying. She was, besides, a magnificent Houdan in most points, and won first and cup at the Palace on two occasions. She was a bird of splendid constitution, and I showed her till her seventh year. The birds with smaller crests have the larger combs, which always shoot out and look fresher when laying, but I don't think the large comb in itself indicates much, and I would quite as soon take my chance for eggs with the large-crested birds as with the large-combed ones.

"In rearing and preparing Houdans for the show-pen, I always coop my chickens out on the grass after the first day or two. At two months I draft them off into runs, separating the sexes. The cockerels can always be distinguished at this age. The pullets need nothing further than the clean grass run until they get developed and old enough to exhibit, but the grass runs must be clean, and no mud about. Old hens also require nothing but clean grass runs to moult out into proper exhibition form. Cockerels and cocks require more care and separate attention. Cockerels may run together till four months old, but those intended for show must then be separated and put into small, dry houses, each bird having a house to himself. These houses should be weather-proof and shaded from the sun ; otherwise the crests and saddles get tanned, which spoils the appearance of the bird. Indeed, it is almost impossible to moult a Houdan cock so that he shall be in really tip-top feather and condition, unless he has the accommodation I have stated. When moulting the hens, I never give them anything other than the ordinary food, except a cabbage or two to peck at now and again. But I always give the cockerels and cocks a little animal food —the cockerels twice a week, the cocks three or four times in the same period.

"Great care should be taken not to allow too many chickens to crowd together when they get up to about two months old. This they are very apt to do when the hens are taken away, the chickens from two coops crowding into one. If this is allowed to last, roup is almost sure to break out, and Houdans are very susceptible to this complaint if once allowed to crowd together. But they can stand wet and cold as well as any fowls. I have cooped chickens a few days old out in bitterly cold weather early in March, and they have stood snow and wet without my losing a chicken; but they were kept scrupulously clean, and their coops perfectly dry. It is only with neglect that mischief is done. Half a dozen half-grown chickens sleeping together in a dirty coop, and allowed to run out, will almost certainly contract roup."

The following article, contributed by Mr. T. Henry Thornber, Brookside Farm, Cheadle, refers more especially to the breeding of Houdans for purposes of utility, and to the results when so bred, while not necessarily losing sight of exhibition properties. It will be observed that, when a really high average of eggs is in view—and the averages stated below are so high as to excite surprise—Mr. Thornber's opinion is somewhat different from that of Mr. Thomas in regard to the connection between egg production and the size of the hen's comb.

Qualities of Houdans.

"There can be no question of the value of this breed as layers, and as table birds. A properly reared and properly fed Houdan of a good laying strain, hatched in March or April, should commence to lay in October, and should be laying three eggs per week by the end of November. From my experience, I find that they soon run up to four eggs per week, generally about the latter end of January or middle of February. After this, according to my egg-recording books, there seems to be no increase in the number per week until about the middle of April, when there has been an increase for most of my pullets to five eggs per bird per week, which high rate has lasted till about the middle of June. Towards the latter end of June there has been a diminution to three per week, and by the end of July I have been having only two per week per bird. After this latter month the laying quickly ceases and the birds go into moult, which, with a little care and the use of Douglas mixture, should not last more than about five weeks. They come on to lay again very quickly after the completion of the moult, and, according to the behaviour of my birds, there seems to be practically no shrinkage in their laying powers during their second year of laying, although they start laying rather later and continue until a later part of the year. The succeeding moult, after the second year's laying, appears more prolonged and more exhausting, and I find a very considerable reduction in the number of eggs afterwards. My laying stock average per annum has varied from 160 to 189 eggs. I get a number of eggs of quite a tinted appearance, rather deeper than cream colour, amongst the rest, the majority of which are snow white; yet the birds are all bred the same, and have been so for some years. I have never been able to account for it.

"Selected birds have done much better than the above. My breeding stock are kept in pens, each comprising seven pullets or hens and a cock, in pretty large runs. There are five of these breeding-pens, which are also fed a little differently from the general flock. These 35 birds, selected to breed from as good layers, have averaged as follows, during the last four years, counting from November 1 to November 1 :—

Year.	Per Bird.	Stock.
1896-7	207	All from pullets.
1897-8	203	About 20 per cent. hens, the rest pullets.
1898-9	208	About 25 per cent. hens, the rest pullets.
1899-0	226	All from pullets.

I consider a Houdan worthy of the name of a layer when she lays 200 eggs between the beginning of the November after her being hatched, and the beginning of the following November.

"As a table fowl, the Houdan is very hard to beat, carrying a large proportion of its meat upon the breast, having a nice white flesh and white skin, being fine in the bone, and of excellent flavour. I find the cockerels to grow very quickly indeed, and have killed birds which I considered faulty at seven months old weighing from 6½ lbs. to 7½ lbs., plucked but not drawn. These birds had never had a day's confined or forced feeding in their lives, and they carried very little fat, but a nice quantity of good, white meat.

Breeding Houdans.

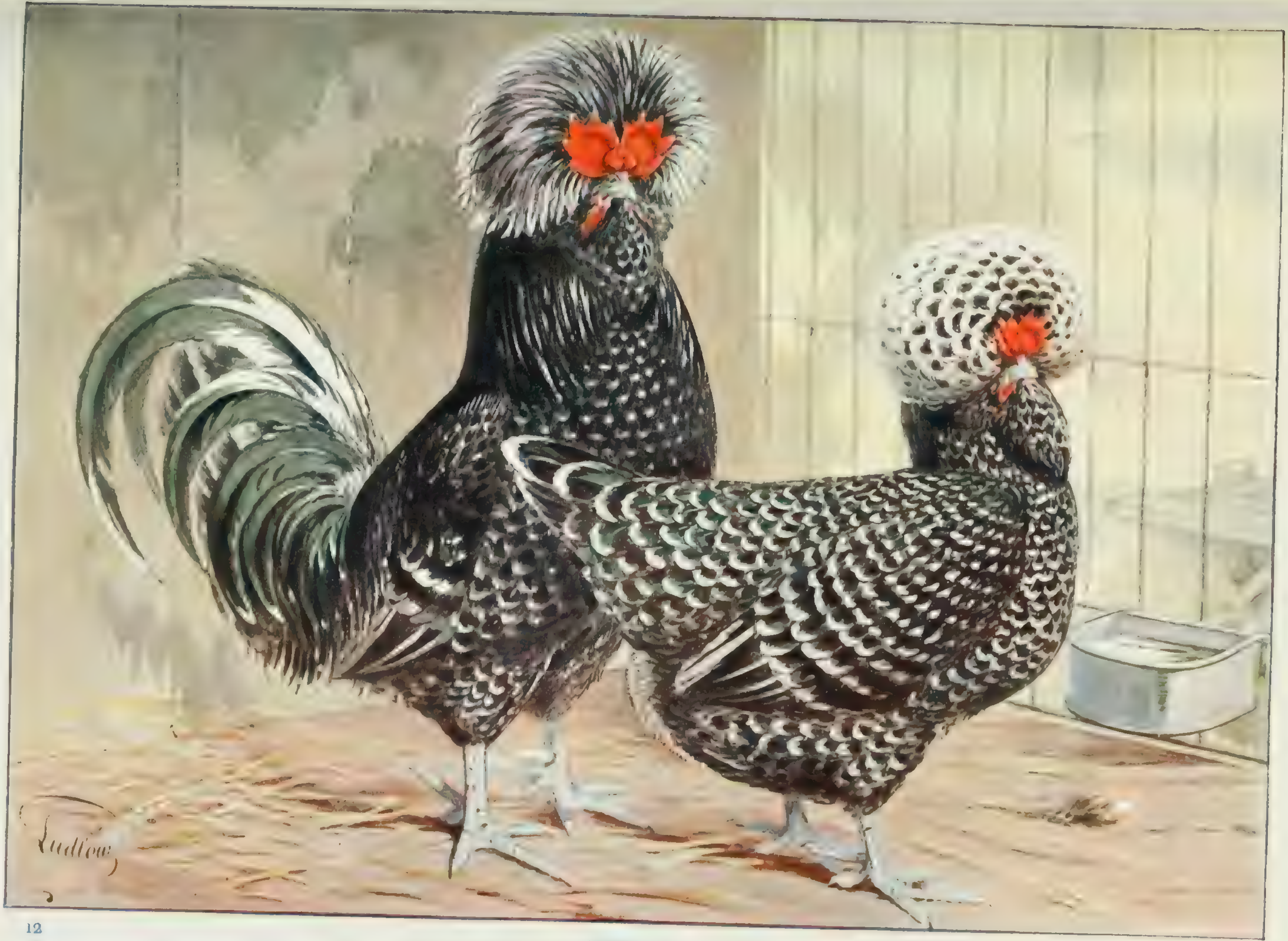
"One may breed the Houdan, as also other breeds, for either utility or exhibition, and not have any great difficulty; but, when you come to breed for utility *and* exhibition, the difficulties are far greater. However, by great care these points may be combined to such an extent as to satisfy the most exacting critic. Personally, I am inclined to think that the male bird has not such a marked influence upon the laying powers of his daughters as many people are inclined to think, but that he is more responsible for the outside qualities, colour, size of crest, beard, tail carriage, colour of legs, and so on. I look to the hen to produce the laying qualities, and also to influence the size, although it is always advisable to breed from a male bird of some pretensions to a laying strain, if possible, and as large as possible. From my experience, a neat, compact, sprightly pullet, of medium colour, weighing about 6 lbs., with a nice moderate-sized crest, beard, and muff, mottled or dark legs, not light coloured legs, carrying her wings well tucked up and her tail fairly high, will breed a good utility bird and a good exhibition bird in one, if mated with a large, dark two-year-old cock, carrying his crest well back, and as large a crest as possible, provided always that it is of a true 'fall back' type of crest, and not the wild 'all over the place' style which has of late appeared so often in the show-pen. I object most strongly to the use of a bird of either sex which has a 'wild' crest, or which carries its tail low, as it appears to me that you can get no good results from such birds, either as show birds or as layers.

"The very finest laying strains of Houdans in this country are not birds of excessive size, nor are they birds carrying an extraordinary crest, but are more cobby in build, more lively in movement, and more developed in their combs; in fact they have considerably larger combs than the first-rate exhibition specimens. Therefore, in mating to combine the qualities, I would emphasise the desirability of breeding from pullets answering this description, and mating with a cock which possesses the show points in a marked degree. Perhaps it is not requisite for me to warn breeders against the haphazard introduction of new blood, when once a laying strain has been built up. It takes years to produce a laying strain of high repute, but one season's careless introduction of male birds from another strain, however good show birds, may, and probably will, spoil it. I always pick a cock with a very small, neat comb, as otherwise one would breed birds with combs which would be too large and ugly, it being usual for a good strain of layers to carry a slightly larger comb than the show-pen requires. Therefore use small-combed cocks to reduce the combs of their successors to a proper size for exhibition. Bumble-foot, which the five-toed breeds are prone to develop, has never yet made its appearance amongst my stock.

"As a layer, I can see no use in crossing so good a bird as the Houdan; but, as table fowls, I think that the Houdan cock crossed with Buff Orpington pullets, or Indian Game cock crossed on to Houdan pullets, will be found more profitable birds than the vaunted Indian Game-Dorking. It matures more quickly, is ready for table sooner and at less expense, and there is less mortality amongst the chickens, whilst it certainly will run to within 1 lb. or 1½ lbs. of Indian Game-Dorking weight.

"Their food is, a hot breakfast of one part barley meal, one part sharps, and one part Indian meal mixed with boiling liquor off meat and bones. For evening feed, generally best English wheat. Only two feeds per day. They are on grass runs of large extent, and have at hand flint grit and oyster shell. They are kept in dry houses, well ventilated, with very large windows admitting splendid light, two windows to each house. The land is rather heavy and clayish, in exposed position, with rather heavy rainfall. Water supplied fresh daily, very cold, from a deep well, very hard water indeed. I have found my birds always great foragers, always on the move and most hardy, winter frosts and snow not making any difference to their laying. I never knew one to go broody. As the crests retain much moisture in wet weather, I am particular about the houses having extremely good ventilation to carry off the humid atmosphere when the birds are roosting, but no draughts."

The type of Houdan bred in America differs somewhat from the English. From all the descriptions we have seen, the comb appears to be preferred of a two-horned rather than leaf character, and the plumage darker than in England. These birds appear, in fact, to have perpetuated that darker and two-horned type, well known at the time to be due to crossing with the Crêve, which was very prevalent in England about 1872, but has since been superseded here by the more evenly broken plumage and leaf comb of the original breed.



12

HOUDANS

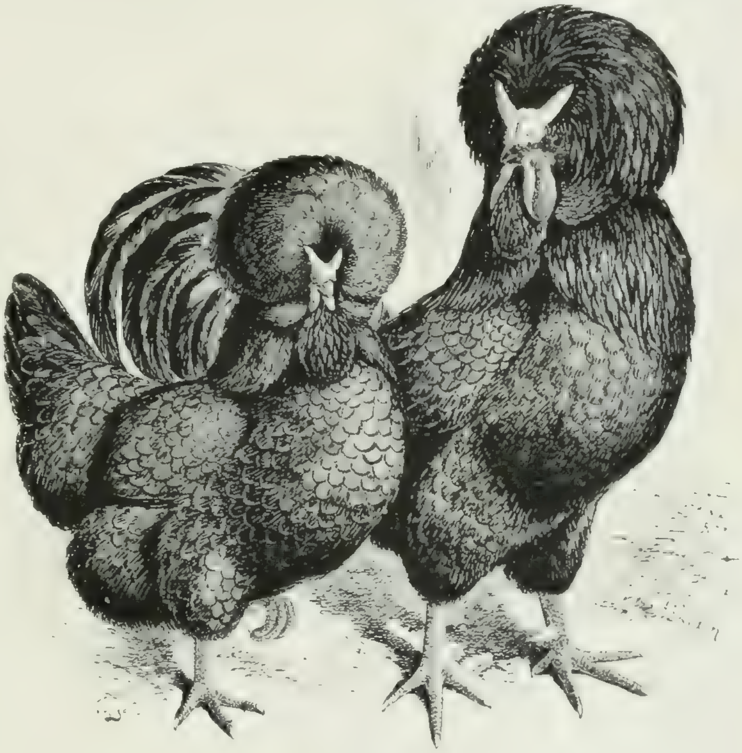
The Houdan is a valuable fowl for crossing. With the Brahma it makes a large and hardy table-fowl of medium quality, much like the Dorking-Brahma, but with rather finer bone and somewhat more tender flesh. The Faverolles presently mentioned is a further development of such crossing. Crossed with the White Leghorn, the produce is generally a white fowl with very small crest, an admirable layer (though not surpassing the pure breeds), but of better flesh than the Leghorn, and without that tendency to roup in some circumstances which has been referred to in connection with the Houdan. One or two poultry-farmers of our acquaintance have expressed special approval of this cross. That with the Minorca is somewhat similar, but more irregular in colour.

Crêvecœurs.

The Crêvecœur is another of the oldest of the French breeds, having been described by the late Mr. Vivian in *The Poultry Book* of 1853. At that time he possessed two varieties, one all black except that the cock's hackles and saddle feathers were often mingled with gold or red; the other a mixture or mottle of black and white. Blues and Whites have also been exhibited at one time or another, as is so usual with all black breeds; but we have not now seen any but black Crêves for many years. The Crêvecœur much resembles the Houdan in general type of body, but is of more massive make, with heavier fluff and stern. Originally the crest and muffling were heavier, but the Houdan crest has now been bred up to about as much, in all probability by a Crêve cross, as nearly black Houdans with two-horned combs were at one time very prevalent. The Crêve comb consists of two large coral-red horns, meeting at the base like a letter **V**. Except in this point, its large size, and the heavier build, the Crêve might almost be described as a large black Polish fowl. The heavy stern and rather ample fluff have often disposed us to believe there has been at some time a Cochin cross, and this is to some extent corroborated by the large appetite, for which the Crêve is remarkable among French breeds.

Qualities of Crêvecœurs.

Economically this breed has changed a great deal since its introduction into England. It always laid a very large white egg; but in the early days these were laid rather sparingly, and the birds were found very delicate and subject to roup, and difficult to rear. But somewhere about 1870 a change took place, either from the stock already in England becoming better acclimatised, or from some other and hardier stock being imported. Mr. R. B. Wood reported them in 1872 to be nearly as hardy as Houdans, and good layers; and from that date their reputation in both respects has steadily improved, so that Crêves must now be pronounced excellent layers, equally good table-birds, and hardy fowls. It is the more difficult to understand the great diminution for years past in the number of those who keep them, and why specimens are so rarely seen at ordinary shows. They are distinctly profitable fowls, not difficult to breed to exhibition points, and easily kept within bounds.



Crêvecœurs.

Mr. S. W. Thomas, Forest Fach, Swansea, kindly contributes the following article on Crêvecœurs as bred at the present day:

"This breed, I think, is older than the Houdan, and I have come to this conclusion after noting the results of various crosses between the Houdan and other varieties. The crosses come mostly black, or nearly so, clearly reverting to the Crêve, and that of the Houdan and Silver Poland produces fowl almost indistinguishable from a Crêve, except for the presence of the fifth toe on some of them.

"Why Crêves are not more popular than they are is most surprising to me. They are amongst the very finest and handsomest and best of fowls. I believe, for a large fowl, they are the quickest of all in growth, and so prolific are they that I had pullets this summer laying rather under five months old. They breed very true, and there is no variety in which a breeder can get so quickly to the front if he so minds. I have kept them about fifteen or sixteen years. Shortly after I started keeping them I had the great good fortune to secure the whole of Mr. R. B. Wood's stock, the choicest strain in the country, when he gave up the variety. I never found them delicate, but they are an excitable fowl, and when overfed very subject to apoplexy. They are even quicker in growth than the Houdan, and though there is not the difference in the average size of the two varieties that there was at one time, the very finest Crêves even now attain greater size than the largest Houdans.

"Combs and crests are better than they used to be. We have large, full, evenly shaped crests, and good even combs, for the most part of the correct **V** shape; and in colour we have distinctly improved. We have more of the rich green black, and less of the rusty purple black than formerly. There is one disadvantage, however, in the green black. Birds of this colour have a strong tendency to white in crest, much more so, I find, than the duller black; and the cocks and cockerels frequently get coloured feathers in both hackle and saddle.

"In body type Crêves should be similar to Houdans, viz. square, thick-set bodies, long in the keel and broad in the breast, legs black or blue, crests full and smooth in front, and a two-horned comb, with no side sprigs, shaped something like the letter V. In breeding for exhibition, if good constitutioned young birds of good green black colour, with the necessary quality in head-points, be selected to breed from, the produce will be so uniformly good as to surprise the breeder not acquainted with this variety.

"To revert again to their supposed delicacy, I would remark that my runs are very exposed, on heavy, damp clay soil. Yet my Crêves do well, and, if not overfed, will lay with the best—and such eggs!—the largest, I should say, laid by any variety of poultry. I have had pullets laying in frost and snow, when not even my Brahmas gave me an egg. Like Houdans, they are magnificent table fowls. But they are great eaters, and fatten very quickly.

"Neither Houdans nor Crêves look well or do well in dirty, muddy runs, but if given dry and clean houses to sleep in, and good, clean grass runs in which to get about, nothing can beat them for table and laying purposes combined. As regards feeding, I feed my Crêves and Houdans in the same way: Spratt, oatmeal, and sharps for morning feed; green food midday; heavy white oats or best wheat in the evening; and occasionally a little small, round maize in the winter.

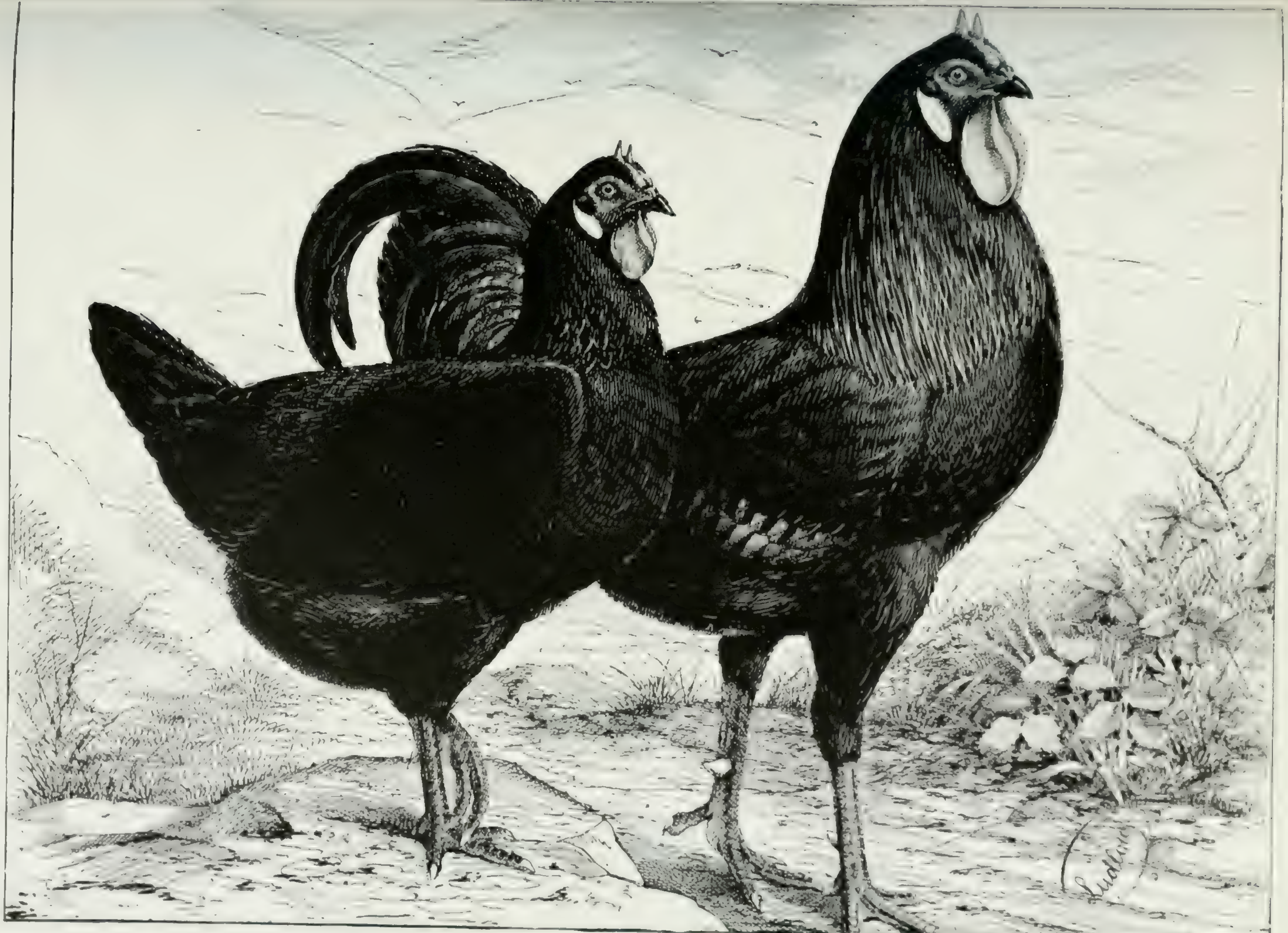
"Houdans and Crêves make capital crosses with either Brahmas or Plymouth Rocks. Either cross is extremely hardy, very large, wonderful layers, and very meaty fowls for the table. I can strongly recommend either cross."

We only add to the above remarks, that it is advisable for stock birds to have the crest either tied up, or cut off in the same manner as Polish, when not required for exhibition purposes, and for similar reasons. Such procedure will do much to prevent the excitability mentioned above, which used also to be a well-known difficulty amongst Polish breeders.

La Flèche.

The La Flèche fowl has never been so popular in England as either of the preceding, chiefly owing to first importations being somewhat delicate, a defect since remedied; partly also, perhaps, because there was not sufficient of distinctness in its characteristics. The Polish blood in its veins is shown by the two-horned comb, the small crest in many specimens, and the nostrils; but the carriage, and white ear-lobes, and green-black plumage, evidently show a cross with the Spanish fowl, as another progenitor. This breed formerly supplied many of the best fowls for the Paris markets; but both it and the Houdan and Crêve have lately been greatly displaced by more recent creations of the French breeders.

In general appearance the La Flèche is a tall, Spanish-looking fowl, though not now bred quite so tall and upright as formerly. The size is larger than Spanish, fatted specimens often reaching 11 lbs., and usual weights being 8 lbs. for cocks and 6 lbs. for hens when shown alive. The bird has little apparent Polish "character" about it, being high on leg, with rather long back and flowing tail. The head is smooth-faced and rather long, the comb consisting of two rather small horns of the **V** character, but standing nearly upright, behind which is often a very small crest of a few short feathers slanting backward; but specimens are preferred without any, and much crest is penalised. The wattles are long and pendulous, the ear-lobes round, of



LA FLÈCHE.

medium size, smooth and pure white. The back should slope somewhat towards the tail, and the keel be long and straight. The plumage is close, of a glossy green-black, the legs dark slate to almost black. In breeding, the combs, absence or almost absence of crest, and good ear-lobes chiefly need attention, the plumage and general shape being usually very uniform.

This fowl lays large white eggs, which are produced pretty freely and tolerably early under favourable circumstances. On dry, suitable soils La Flèche chickens fledge rapidly, and, with good and nourishing food and freedom from damp, are quite hardy.

Faverolles.

One of the most popular French breeds at present—the Faverolles *—is of later creation. Although the outcome of rather complicated crossing, it quickly took strong hold upon English breeders, owing to its superb table qualities combined with hardiness and quick growth, and was not long in securing the support of a Club and a place in the Standard. The following article upon the points, qualities, and breeding of the Faverolles was contributed by the late Mr. J. P. W. Marx, Nottingham, well known as having taken a leading part in popularising and standardising the fowl.

"Faverolles have for some time been common in the northern part of France, where they were regarded as simply useful fowls. They are the result of crosses to produce good layers, particularly in winter, whose chickens are strong, hardy, and quick-growing, with thin, white skin and fine bone, abundantly covered with meat, and lending themselves readily, if need be, to artificial fattening. Brahmas or Cochins, Dorkings, and Houdans were used to produce Faverolles; and as the different varieties of those breeds were used indiscriminately, the Faverolles are met with of various colours, yet with well-defined characteristics of habit, shape, and quality. The salmon, and the white or ermine varieties, gradually became most numerous on account of their better laying and table qualities A few seem to have been kept in England about 1892 or 1893, but little was heard of them till 1896; since then they have become scattered all over the country.

"Whatever the colour of the Faverolles, the general characteristics are the same. In both sexes the comb is single, upright, medium in size, with neat serrations and free from coarseness. This is a difficult point, since of the breeds which were selected to make up the Faverolles, the Dorking alone has a single comb which falls over in the hen. The peculiar combs of the Brahma and Houdan are strongly hereditary, and thus all kinds of combs crop up in the Faverolles, and most careful selection is required to get and retain the correct type. The beard and muffling should be very abundant, the beard thick and full rather than long and thin. These, again, being only found in one of the original breeds—the Houdan—are difficult to breed; indeed, the head of the Faverolles is one of its most characteristic and important features. The head itself is broad and short, with small, thin wattles and stout, short beak. The head should be free from crest, which is nearly bred out; still there remain traces, particularly in the cocks, in the shape of a few short, upright feathers either side of the comb, which would only be noticed by a breeder who has had experience in eradicating crested blood. The short, stout neck is thickly covered with rather close-fitting hackles. The body is broad, deep, and wide; the back very broad and flat; the breast is also broad, with the keel-bone deep and prominent; the whole giving a sturdy, massive look to the fowl. Greater length of keel and back is seen in the hen. The wings show boldly in front, yet are distinctly small. The thighs are short and set wide apart, with the knees quite straight. The shanks are of medium length. A dumpy, short-legged fowl is not wanted, and the excessive shortness of leg detracted very much from an otherwise capital hen which was most successfully shown in 1900. The leg should be fairly stout in bone without being coarse, and be slightly feathered on the outside down to the end of the outer toe. The leg feather should be soft in texture, with no sign of the vulture-hock too frequently met with. The toes are five in number, and the extra or fifth toe, as in the Dorking, should be clear and distinct. The tail feathers and sickles are full and broad; the sickles incline, however, to be short in length, and are carried rather upright, as in the Brahma; a large tail with long sickles carried low or straight is not in keeping with the build of the bird. The tail of the hen is fan-shaped, and carried rather high.

"Cocks should weigh 7 lbs. to 8½ lbs.; hens, 6 lbs. to 7 lbs.; cockerels, 6½ lbs. to 7½ lbs.; and pullets, 5 lbs. to 6½ lbs. These weights are not excessive, and are often exceeded, though generally at the expense of quality.

"The colour of the Salmon Faverolles cock is quite different from that of the hen. Some are a mixture of black and silvery white, like the Silver Dorking; others, which have the preference, are warmer in colour, like the dark Dorking. In the exhibition salmon cock the beak, legs, and feet are white; any pink colour on the leg should be dealt with severely if it is too prevalent, and should be eradicated. The skin also is white and very fine; a coarse, red skin is a distinct fault. The face, lobes, and wattles are red, nearly concealed by the muffling and beard, which is black, not ticked with white. Neck and saddle-hackles are straw colour, quite free from any stripe, although many cocks still retain the Brahma hackle, and probably will do so for some time yet. The breast is black; very few are sound in breast colour; the majority show white mottling, particularly towards the bottom, others even have feathers tipped with bronze or red. More latitude is allowed with the back and shoulders, which may be a mixture of black, white, and brown. The wing-bow is straw colour, the wing-bar black, and the outside of the secondaries white. The tail, under colour, and thighs are black; the tail coverts may be brown. Some cocks with much less black in them have the breast mottled with red and white, and the back and shoulders a rich red brown; these are very handsome, but not in accord with the present standard.

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* Faverolles is the name of a place, and should properly be always spelt with the terminal *s*. Such a word as Faverolle is a barbarism; but it seems creeping in as the English form, and perhaps cannot be helped. The effort should however be made, to which end we make this direct mention of the matter.

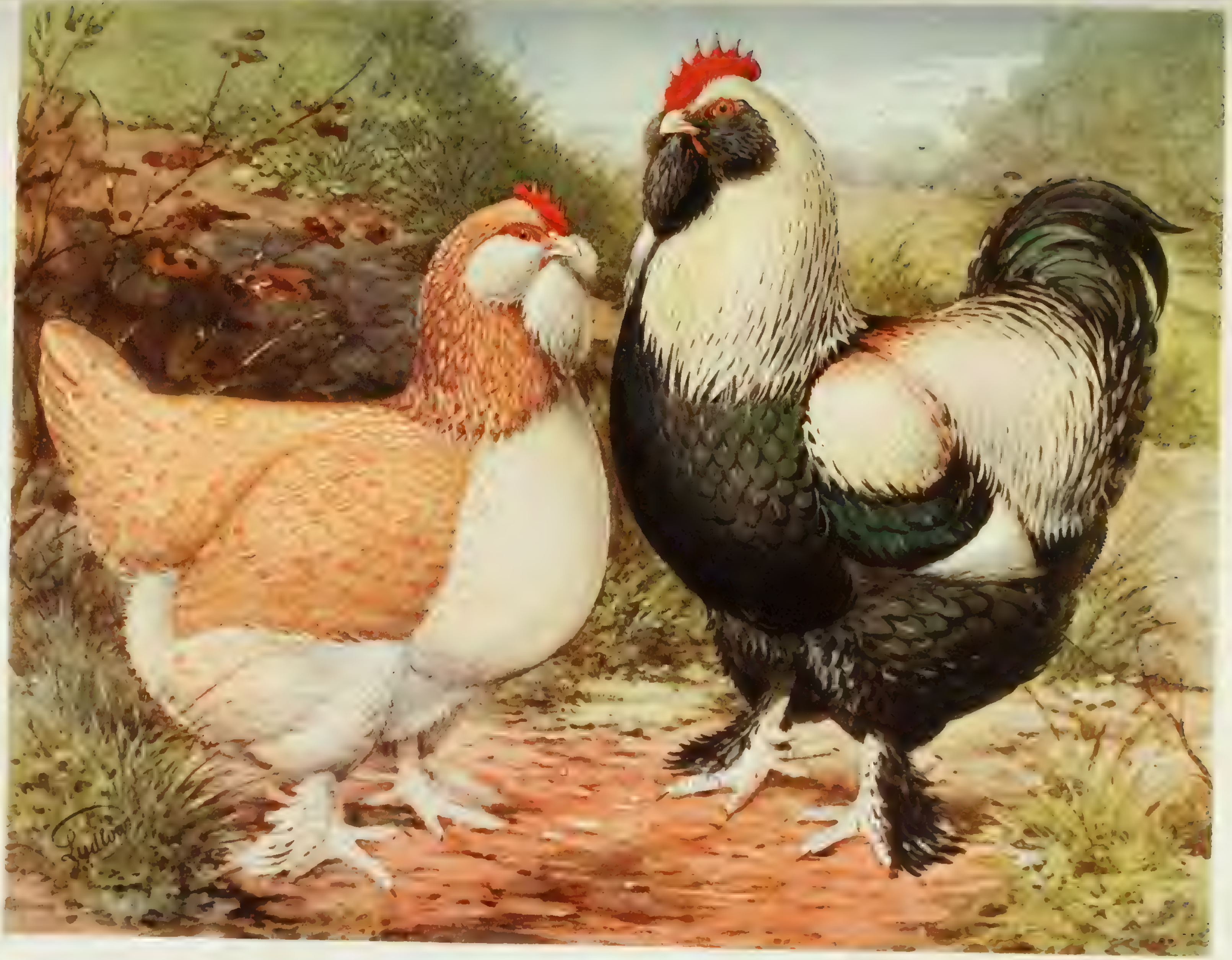
"The Salmon hen is much like a Wheaten Game. The head and neck are a wheaten brown, broadly striped with a darker brown. Beard and muffling (both are much heavier than in the cock) are a creamy white. Back, shoulders, and wings wheaten brown, the colour running lighter on the sides until it meets the cream colour of the breast, thighs, and under-colour. Primaries, secondaries, and tail are wheaten brown; these at present are very imperfect, for a great deal of black or white, or both, is to be found in most hens. Face, wattles, legs, and feet are the same as in the cocks. The definition of the colour as 'wheaten brown' is not a happy one; it may mean the warm brown of red wheat or the much lighter shade of white wheat, and the latter seems to be the colour which is required. The fashionable Salmon hen is a warm cream colour with a pale brown colour on her neck, back, and tail; a delicate pink or salmon shade in these colours is preferable to a faded, washed-out white colour. Any trace of buff, gold, or hard brassy colour should be discarded.

"There is a very handsome strain of what may be called red wheaten brown hens; the back and sides are blotched with a deep chestnut brown, which runs on to the tail, and the hackles are broadly striped with the same colour; they have a rough, hardy look, but are too dark and red for the colouring of the standard.

"The Ermine or Light Faverolles are marked like light Brahmas, and, remembering their origin, it will be found quite as difficult to obtain the clear, densely striped hackles with pure white body colour free from ticking. The suggestions before given for breeding light Brahmas should be closely followed in mating.

"In mating Salmon Faverolles, comb, width of back and between the thighs should be attended to in both sexes. The comb should be free from side sprigs, and, if possible, of fine quality in the hen, and upright. The best combs procurable should be used, for faults here are sure to appear in the chickens. A cock with heavy beard and muffling is valuable as a breeder. His neck and saddle hackles should be a yellow straw shade in preference to white for cockerel breeding; a slight stripe or ticking of brown or brownish grey may be tolerated in a pullet breeder. Hens with any black in the hackle, even at the tip, should be cautiously bred from, unless it is known their mother was better than they in hackle colour. The feather itself should be rather short, but broad, to give room for the darker centre. The breast of the cock should be a solid black from throat to thigh; many are ticked with white, and a few have a mottling of red or brown, and these are likely to breed better coloured chickens than those ticked with white. The sounder the black of the thigh and under-colour the better; cocks showing much white, breed cockerels lighter than themselves, and pullets too weak, almost white in under-colour. The tail coverts should be a dark chestnut brown in a pullet-breeding cock, and the rest of the tail black. The sheen on the black throughout the cock should be a rich metallic bronze, not a beetle green shade. The hens should be as near the standard colour as can be obtained; the weak points are wings and tail, where black and white are sure to be found. Hens with much white in wing should be mated with a bird sound in wing, with very little white on the outside of the secondaries, plenty of bronze on the shoulders, and very little white ticking in his under-colour. The brown colour of the tail may be improved by selecting a cock with abundance of coppery brown lustre and brown tail coverts; if the tails of his daughters show an improvement, he may be mated up next year with the best of them in that respect. The shaft and down of the feather quite to the skin should be a creamy or wheaten brown; hens with black or ashen grey down throw a number of pullets with black in wing and tail.

"Faverolles chickens are very hardy and easy to rear, either artificially or naturally,



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FAVEROLLES.

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providing that they are given as much liberty as possible, for after the first week they are keen foragers on their own account without being wild, and prefer food of their own finding if it can be obtained. They are always in good flesh, and consequently are very suitable to rear for supplying *petits poussins*; this object was kept prominently in mind at their inception. The framers of the Standard also appear to have drawn it up from a meat-producing point of view; perhaps rightly so, for the breed has found much favour with the fatters, some of whom declare it to be the nearest approach to the old Sussex breed they have met with for some time. The chickens are white when hatched, and their nest feathers are also white; with each subsequent growth more colour appears, but only in the final change do the cockerels acquire a solid black breast, so the weeding-out process must not be too hastily conducted. They grow and mature very quickly until the final change into adult plumage, when, like Brahmas and Dorkings, the feathers come rather slowly.

"The claims of the Faverolles as a table fowl seem to have obscured its excellent laying qualities. Helped by its early maturing quality, however, the Faverolles is also a good winter and spring layer, not easily checked by climatic changes. The eggs vary in colour from white to deep brown; most usually they are a pale brown. Pullets' eggs are deficient in size, but those from mature birds are above the average. The hens are slow to come on broody, though exemplary sitters and mothers, and if checked from broodiness soon recommence laying.

"The breed when sufficiently established should make the cocks suitable for crossing; the hens have been freely and successfully used with Dorking and Indian Game cocks to produce table poultry. The early and continued laying of the Faverolles hens, and the hardy nature and rapid growth of their chickens, make them superior to the Dorking for mating with the Indian Game cocks."

Although this breed has passed what may be called a nascent or forming stage, it is not uninteresting here to recall the remarks of Mr. Lewis Wright with especial reference to the Standard. Commenting on this, he said: "In regard even to the value of the points, in such a fowl as this 20 points for muffling and 25 for colour seem to us injudiciously high compared with 20 for symmetry. But more especially we are afraid that the colour laid down for the two sexes of Salmon Faverolles will be found incompatible, unless males and females are to be bred from different strains. The mainly black and white of the cocks is not a compatible colour with the wheaten brown (free from black) of the hens. The latter colour is nearly the same as the pale-breasted wheaten Sussex hens, and the match for this is a Black-*red* cock: on the other other hand, such a colour in cocks requires a tail in the hens edged with black on the top. Rather more red in the cock's top-colour and wings, and some black in the top edge of the hen's tail, would make all compatible.

Although in the Poultry Club Standards no cognisance is taken of any variety of the Faverolles but the Salmon, this popular French breed may now be seen in other colours, since blacks, buffs, blues and whites have been on exhibition during the past few years. The white is the latest addition to the list, and will apparently become much esteemed as a useful and charming variety in the very near future.

A number of other races of poultry are known in different parts of France, and are worthy of mention here. For the following notes on these we are indebted to Mr. Edward Brown, F.L.S., Secretary of the National Poultry Organisation Society. It will be seen that one breed mentioned is expressly ascribed to the Langshan; the Barbezieux has been pronounced by many fanciers who have seen it in France to be evidently a Minorca cross; and we have seen fowls produced by crossing a Light Brahma cock with Houdan hens which precisely resembled in all but their variable combs both the description of the Bourbourg fowl and the only specimen of the fowl itself which we have ever seen.

La Bresse Fowls.

"Amongst the varieties of French poultry, the La Bresse fowl occupies the premier position in respect to its table qualities, if the prices obtained for the best specimens may be taken as evidence. The district where these fowls are bred comprises part of the Department of Ain and Seine-et-Loire, that is, to the south of the old province of Burgundy, and in that district the poultry industry is a very important branch of agriculture. For a long period of time Bresse poulardes and capons have had a great reputation for the quality and delicacy of their flesh. It is stated that so far back as the years 1815 to 1818, when the city of Bourg was occupied by the Allied Armies, the quality of the poultry was so appreciated that the fame of these birds was carried into other countries.

"In shape the La Bresse fowls are distinctly

Mediterranean, and were it not for the colour of the legs many would think they were Leghorns, though they are somewhat longer in body. Few would imagine that they were so fine for table qualities, and from the appearance it might be assumed that they would be distinctly better as layers. The cock is elegant in carriage, shapely, and active ; the head is medium in size, and fine in its lines ; the beak is strong and of a horn colour ; the eyes are lively and bright ; the comb is single, and of the largest size, though not nearly so large as in the English Leghorn ; the comb is upright and well cut ; the wattles are long ; the ear-lobes white and well defined ; the neck is medium in length, inclining rather to be long, and is well covered with hackles; the back slopes gently towards the tail ; the breast is round, rather prominent, and the thighs somewhat strong, but the legs and feet are fine in bone, indicative of slightness of frame throughout, which is one of the features of this breed ; the legs and feet are of a slate grey colour, with black nails ; the tail is well furnished, though the sickles are not very long. In the hens the comb falls to one side.

" There are three varieties of this race—Black, called *La Bresse de Louhans ;* Grey, called *La Bresse de Bourg;* and White, called *La Bresse de Beny-Marboz.* In the Bresse district the Blacks are usually regarded as the better layers, but the Whites are preferred for table purposes. The black variety is very pretty, showing those metallic reflections which always add to the beauty of birds of this colour. In the grey variety the plumage is white pencilled with grey, the neck hackle being almost entirely white, except that the points are grey. In this case the beak is blue and the legs clear grey. In the white variety the plumage is, of course, self-coloured and the legs dark grey. Whites and blacks are more numerous than the greys.

" In Paris, as well as other parts of France, in Italy and Switzerland, at the best hotels *Poules de la Bresse* are found on the *menus.* The prices of these birds for table purposes are very high. I have been asked as much as twenty francs for a fat poularde in the Bourg market, and they command still higher figures in Paris. Part of their value arises, however, from the system of fattening which is carried out in these districts, and there can be no question that for delicacy of flesh they have no superior. The lightness of bone is, of course, a very great recommendation, and the breed is specially remarkable for the great increase of weight as a result of fattening. But they are valued for their quality rather than for their size, which is not great, being less than some of the largest English Leghorns ; few of the males when in working condition scale at more than 6 lbs.

" As egg-producers they hold a very important place in France, and I have frequently been told in the La Bresse country that there is no breed which touches them in this respect. This to a large extent confirms my own observations, as I kept white La Bresse for several years, and found them amongst the best layers of any breed. They are not, however, exceptionally good in the winter, and this might be anticipated from their appearance. The eggs are white and of good size, as a rule weighing upwards of 2 ozs.

Du Mans.

" The Du Mans fowl is bred to a considerable extent in the Department of La Sarthe, but it is entirely kept for its economic qualities. It has never attained to any great popularity in France, other than in the district of South Normandy which gives it a name, where it is met with largely, and whence quantities of these birds are sent up to the Paris markets. In appearance it is very similar in many respects to the La Flèche, except that it has a less upright appearance, and the head is different. Instead of the horned comb which is so characteristic of the La Flèche, it has a rose comb, and I have seen this comb rather coarse. It is entirely black in plumage. except that the small ear-feathers are frequently white or almost white ; the ear-lobes are white like the La Flèche. Even at the great Paris exhibitions this breed is not much in evidence, and probably owes its popularity more to the skill of the fatteners in the valley of La Sarthe than to its own qualities. It is, however, a quick grower, and when fully grown the weight of bone and offal is small as compared with the total size of body. Some years ago when at Le Mans, I learnt that large numbers of this breed are sent to countries as far away as Russia, and command high prices. It has fine, delicate flesh, and fattens easily, and is an abundant layer.

Courtes-Pattes.

" The Courtes-Pattes is not unknown in this country, though it has never become popular, and the appearance is distinctly against it. It would appear to be in some way related to the La Flèche and the Du Mans varieties, emanating from the same district of France, but it is smaller in body, and the legs are very short indeed. Except in exhibitions, I have very seldom seen specimens of this breed in France, and visits to the La Sarthe district revealed to me that it was more in the hands of dealers and amateurs than bred as an economic fowl. It is entirely black in plumage, with metallic reflections, and heavily feathered. The body is wide and long; the comb thick, single, and upright in the male bird, falling over in the hen, regularly indented and substantial at the base. Like many of the other French breeds, it has a beard, and the ear-feathers are white and rather long; ear-lobes are broad and white. The legs are thick, and grey in colour, the tail being fully furnished and carried rather high. Doubtless there are a goodly number of these birds produced, and at certain seasons of the year they are made into a dish called *Poulets à la Reine*, which can be obtained in the Paris restaurants and cafés by gourmets. It is said to be an abundant layer of large eggs, and a good sitter, but seldom becoming broody.

Du Mantes.

"In France, as in our own country, certain varieties of poultry have been produced by the efforts of individual breeders, and in some cases have been named by them without much regard to other considerations. The Du Mantes was introduced by M. Voitellier, a great breeder of and dealer in poultry, who lived near the town of Mantes, between Paris and Rouen. It in some respects resembles the Faverolles, but is lighter in body. The origin of this breed is uncertain. In appearance it would seem that the Houdan was used in its production, but this is denied by M. Voitellier, who says that it has four toes instead of five as in the Houdan, and in place of an enormous crest it has none, and that instead of the leaf or strawberry comb it has a single comb, standing upright in the male and falling over in the female. The Mantes fowl is also lighter in the body than the Houdan, and partakes more of the Mediterranean type. It is a sitting variety, and in this respect also differs from the Houdan, to which its chief resemblance is that the plumage is marked in the same way, that is, black and white. So far as I have been able to trace it, this variety has not been widely distributed, and is generally met with in the Seine-et-Oise district, around the town of Mantes.

"The size of this fowl is about equal to that of the Houdan, and the plumage like that breed, splashed black and white, neither very white nor very black. The carriage is active and proud; the comb is single, well developed and serrated, upright in the male and falling over in the hen; ear-lobes hidden under a thick cravat of feathers; wattles short, and also hidden by the whiskers, which are large; the legs and feet are short and stout, marbled red, grey, and black, without any trace of feathers. As a layer the Mantes fowl is said to equal the best varieties, and it is a good sitter, without any excessive tendency that way.

Barbezieux.

"The Barbezieux fowl has been called the Minorca of France, and in appearance it is more like the English Minorca than any other French breed. It is rather longer on the leg than most of our Minorcas, and both fine and coarse legs appear to be admissible. It is said to be a good sitter, and in this respect differs distinctly from the Minorca. I have no evidence as to its laying qualities, but it can be made into a good table fowl, as in some of the south-western districts of France birds of this type are met with regularly in the poulterers' shops. It is very erect, with sprightly carriage, breast well forward. The comb is single, well developed, with serrations well cut, upright in the cock, falling upon one side in the hen. The ear-lobes are white and large; wattles red and very broad. The plumage is tight, entirely black, with green and violet reflections in the cock, dull black in the hen. The cock's tail has large sickles. The legs and feet are clean and leaden grey, with four toes. It is a prolific layer of large eggs, with fine flesh, and a good fatter, and is considered hardy.

Gournay Fowls.

"The Gournay fowl is one of the smallest races of French poultry, but is spoken of as a good layer of eggs which are rather above the average in weight. The breed is not very true to type, but they have been characterised as strongly built, single-combed, non-crested birds of Houdan plumage, with only four toes, from which it appears that they may have some relationship with the Mantes fowl.

Cossacks.

"Some medium-sized black fowls are known under the name of Cossacks, but are very little met with. They have large whiskers. I have only occasionally seen specimens of this breed in the French shows. Birds of this type are said to be met with in South Russia and on the borders of the Black Sea, whilst one French writer states that they are to be seen in abundance in the neighbourhood of Scutari. The comb is single, standing upright in both the sexes, with a few indentations. The beard has small, curled feathers right up to the ear-lobes, which are red. The tail of the cock is carried well up, and has two large sickle feathers; the body is well developed, with prominent breast; the legs and feet are grey in colour and clean; the beard is less developed in the hen than in the cock. They are said to be good layers of large-sized white eggs, seldom found to sit, and to have good quality of flesh.

French Cuckoo.

In several Continental countries fowls with what is known as cuckoo plumage are to be found. France owns one such breed, mainly in Brittany, where it is highly esteemed. Of it there are two varieties, namely, the Coucou de France or de Bretagne, and the Coucou de Rennes, the former of which is found in Northern Brittany and the latter in the district adjacent to the city of Rennes. The main difference is that the former has a rose comb, spiked like that of the Hamburgh, and the latter a single comb. These are birds of medium size, not exceeding 7 lbs. for cocks and 5½ lbs. for hens, when fully grown, with short, cobby appearance, as the head and neck are short and thick, and the legs short and strong. The beak is pale in colour and the legs and feet pinkish-white, whilst the somewhat small ear-lobes are white splashed with red. In colour of plumage this breed has a base of steel grey, evenly barred with blue-black. As is usual in French poultry, considerable attention is paid to the flesh qualities, which are excellent, and the flesh and skin are pure white. As layers they are very good indeed, but they are unreliable in maternal qualities. One great point in their favour with the Bretons is that they are very hardy, and cost little to feed owing to their being good foragers.

Bourbourg.

"In the part of Northern France commonly known as the Pas de Calais, lying between Calais and the Belgian border, a variety is now being bred to which the name of Bourbourg has been given. They are chiefly produced for their table qualities. Nearly all the fat fowls consumed in the Department du Nord, from Dunkirk to Lille, are of this variety, the position being taken by reason of their early laying and hatching. They are above the medium in size, and are said to be very hardy, precocious, fine in the quality of their flesh, and fair as layers.

"The Bourbourg cock is a handsome, vigorous bird, thick-set and short in leg. The head is large and rather short; beak short and strong, white, streaked with horn; eyes orange-red; comb single, upright, regularly serrated with large spikes, and rather large; wattle medium sized; ear-lobes little developed and red. There is a beard, formed of white feathers, growing upwards, and the cheeks, red, are slightly covered with small white feathers. The head is white; the neck well arched, covered with an abundance of neck hackle, is white striped with black; back, saddle, and body white; tail black, the coverts edged with white. The body is large, rather sloping in front; thighs stout, covered with an abundance of feathers, but no hock feathers; legs strong and long, very slightly feathered; legs and feet reddish-white, with white toe-nails. Weight, 7 lbs. to 9 lbs. The colour is that of the Light Brahma, or what the French call Ermine. The Bourbourg hen is very pretty, large at the shoulders, with back flat and long, and also of a pretty ermine colour. Her laying is very good, and her salmon-tinted eggs are good in flavour. She sits early and well, is a good mother, but does not sit often, twice in the year at most. Her conformation corresponds with that of the cock, and her weight is from 6 lbs. to 7 lbs. It will be seen that the breed corresponds closely with the ermine-coloured Faverolles; and it has, indeed, been termed by the French themselves the Faverolles of the North.

Fowl of Estaires.

"In the north-eastern district of France the Bourbourg fowl has now a rival, which is called the fowl of Estaires. It would appear that this is a half-bred Langshan, that breed having been largely used in its production; but at the same time it is distinctly different from the Langshan, although it retains some of its features. The plumage is entirely black. The comb is single and large, standing upright in the male bird, but falling over in the hen; the eye is yellow-orange, and the ear-lobes red. The body is carried well forward; the breast large; the tail very short, and terminating in a point. The legs and feet are dark and slightly feathered. It has been suggested that this breed is due to a cross between the Langshan and the Game fowl, and it is noteworthy as showing how the French have introduced the Langshan as well as the Brahma into their races of table poultry."

The predominating impression left from a survey of the French breeds of poultry must be, in the first place, the great value of the Polish race as a source from which may be derived quality of flesh of the highest character, and prolific egg-production; and secondarily, the extraordinary variety of the results attainable from one such source. We may have crest and muffling fully maintained, as in Crêves and Houdans, or all but banished, as in La Flèche and others; and with form and carriage as various as the latter compared with the Faverolles.

The following are the Standards adopted by the Poultry Club for the popularly recognised French breeds:

HOUDANS

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Fairly large, and with a decidedly pronounced protuberance on top, and crested. *Crest :* Large, full, and compact, round on top and not divided or "split," composed of feathers similar to those of the hackle, inclining slightly backward to fully expose the comb. *Beak :* Rather short and stout, well curved, and with wide nostrils. *Eyes :* Bold. *Comb :* Leaf type (somewhat resembling a butterfly placed at the base of the beak), fairly small, well defined, and each side level. *Face :* Muffled. *Muffling :* Large, full, and compact, fitting around to the back of the eyes and almost hiding the face. *Ear-lobes :* Small, entirely concealed by muffling. *Wattles :* Small and well rounded, almost concealed by beard.

Neck.—Of medium length, and with abundant hackle coming well down on the back.

Body.—Broad, deep, and lengthy, as in the Dorking.

Tail.—Full, with the sickles long and well arched.

Legs and Feet.—*Legs :* Short and stout, well apart, and free from feathers. *Toes :* Five in number, and similar to those of the Dorking.

Carriage.—Bold and lively.

Weight.—9 lb. ; cockerel, 7 lb.

HEN

With the exception that the *Crest* is of globular shape, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—7 lb. ; pullet, 6 lb.

COLOUR

Beak : Horn. *Eyes :* Red. *Comb, Face, and Wattles :* Bright red. *Ear-lobes :* White or tinged with pink. *Legs and Feet :* White mottled with lead-blue or black.

Plumage.—Glossy green black ground with pure white mottles, the mottling to be as evenly distributed as possible, except on the flights and secondaries, and in the male bird the sickles and tail-coverts which are irregularly edged with white. The black generally preponderates to a great extent in young Houdans, but what mottling there is should be even and clean.

SCALE OF POINTS

THE COCK

Size	18
Comb..	15
Colour	15
Crest	12
Shape	12
Legs and feet	10
Condition	10
Muffling	8
	100

THE HEN

Size	20
Colour	15
Crest	15
Muffling	12
Shape	10
Legs and feet	10
Condition	10
Comb..	8
	100

Serious defects : Red or straw-coloured feathers ; spur outside the shank ; feathers on shanks or toes ; other than five toes on each foot ; any deformity.

CRÊVECŒURS

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Large, and with a decidedly pronounced protuberance on top. *Beak :* Strong and well curved. *Eyes :* Full. *Comb :* Of the horn type, V-shaped, of moderate size, upright and against the crest, each branch smooth and tapering to a point and free from tynes. *Face :* Muffled. *Ear-lobes :* Small, but not exposed. *Wattles :* Moderately long. *Crest :* Large and full and rounded on top, rising in front so as to show the comb, composed of feathers similar to those of the hackle, and the ends almost touching the neck. *Muffling :* Full and deep, extending to the back of the eyes, hiding the lobes and the face.

Neck.—Long and graceful, and thickly furnished with hackle.

Body.—Large, broad, and practically square. *Breast :* Well rounded. *Back :* Flat. *Wings :* Large, well folded.

Tail.—Full and carried moderately high.

Legs and Feet.—*Legs :* Wide apart, short, and the shanks free from feathers. *Toes :* Four, straight and long.

Carriage.—Bold and elegant.

Weight.—9 lb. ; cockerel, 7 lb.

HEN

With the exception of the *Crest,* which must be of globular shape and almost conceal the comb, the general characteristics are similar to those of the cock, allowing for the natural sexual differences.

Weight.—7 lb. ; pullet, 6 lb.

COLOUR

Beak : Dark horn. *Eyes :* Bright red, although black is admissible. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Black or slate-blue.

Plumage.—Very lustrous green-black. No other colour is admissible, except a few white feathers in the crests of adults, which, however, are not desirable.

SCALE OF POINTS

Crest and muffling	30
Size	20
Comb	15
Colour	15
Symmetry	10
Condition	10
	100

Serious defects : Coloured feathers ; any deformity.

LA FLÈCHE

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Rather long and thin. *Beak :* Long and strong, with nostrils elevated. *Eyes :* Bold. *Comb :* Of the horn type, V-shaped, of medium size, free from side branches, smooth, and erect. *Face :* Smooth, and free from feathers. *Ear-lobes :* Of medium size and fine texture, round and free from folds. *Wattles :* Long, pendulous, and well rounded.

Neck.—Long, with well developed hackle.

Body.—Long. *Back :* Sloping slightly, and tapering towards tail. *Breast :* Fairly deep, and wide front. *Wings :* Large, carried well up, but by no means on the back.

Tail.—Long and full, and carried somewhat low.

Legs and Feet.—*Legs :* Long, and shanks free from feathers. *Toes :* Four on each foot, long and straight.

Carriage.—Graceful.

Weight.—8 lb. ; cockerel, 6 lb.

Plumage.—Close.

HEN

Except that the *Tail* is rather erect, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—6 lb. ; pullet, 5 lb.

COLOUR

Beak : Dark horn. *Eyes :* Bright red, black admissible. *Comb, Face, and Wattles :* Red. *Ear-lobes :* Pure white. *Legs and Feet :* Black or dark slate.

Plumage.—Black, with brilliant green gloss.

SCALE OF POINTS

Head : comb, 10 ; face, 10 ; ear-lobes, 10 ..	30
Size	20
Colour	20
Shape	20
Condition	10
	100

Serious defects : Feathers other than black ; red ear-lobes ; presence of crest ; shanks other than black or dark lead ; any deformity.

FAVEROLLES

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Broad, flat, and short. *Beak :* Stout and short. *Comb :* Single, of medium size and upright carriage, with four to six serrations, and of smooth surface. *Face :* Muffled. *Beard and Muffling :* Full, wide, and short. *Ear-lobes and Wattles :* Small, and partially concealed by the muffles.

Neck.—Short and thick, and well let into the body.

Body.—Thick and deep and "cloddy." *Breast :* Broad, with a deep keel bone coming well forward but not too rounded. *Back :* Flat and square, very broad across the shoulders and saddle. *Wings :* Small, carried closely to the body.

Tail.—Of medium length, and carried rather upright, the feathers being broad. Long, thin, and flowing tail feathers, carried either low or straight, are very objectionable.

Legs and Feet.—*Legs :* Thighs short and wide apart, shanks of medium length, stout and straight, and carried well apart (narrowness, or any tendency to be in-kneed, is very objectionable), and sparsely feathered down to the outer toe. *Toes :* Five on each foot, the fifth being divided from the fourth, and the outer toe sparsely feathered.

Carriage.—Active and alert.

Weight.—7 lb. to 8½ lb. ; cockerel, 6½ lb. to 7½ lb.

HEN

With the exception that the *Comb* is much smaller in proportion, and that the *Tail* is fan-shaped, the general characteristics are similar to those of the cock, allowing for the natural sexual differences.

Weight.—6 lb. to 7 lb. ; pullet, 5 lb. to 6½ lb.

COLOUR

Beak : Horn or white. *Eyes :* Grey or hazel. *Comb, Face, Wattles, and Ear-lobes :* Red. *Legs and Feet :* White.

Plumage of the Cock.—*Beard and Muffling :* Solid black. *Hackles :* Straw. *Back and Shoulders :* A mixture of black, white, and brown. *Breast, Thighs, and Under-fluff, Tail, and Shank feathering :* Black. *Wings :* Bow, straw ; bar, black ; secondaries, pure white on the outer edge of the feathers, and black on the inner edge and at the tips ; primaries, black.

Plumage of the Hen.—*Beard and Muffling, Breast, Thighs, and Fluff :* Cream. *Remainder of Plumage :* Wheaten brown, the neck-hackle being striped with a dark shade of the same colour (but free from black), and the wings being of a light shade.

SCALE OF POINTS

Colour	25
Symmetry	20

Muffling	20
Size	15
Condition	10
Comb	10
	100

Serious defects : Skin and legs other than white ; absence of beard and muffs ; featherless shanks and outer toes ; other than five toes on each foot ; hollow breast ; any bodily deformity.

LA BRESSE

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Rather thin, and of medium length. *Beak :* Strong and fairly long. *Eyes :* Bold. *Comb :* Single, of medium size, straight, and erect, the back part following the curve of the neck, deeply and evenly serrated, of fine texture, and free from thumb-marks and side sprigs. *Face :* Smooth and free from feathers. *Ear-lobes :* Well developed and rather pendent. *Wattles :* Of medium length, and rounded at the ends.

Neck.—Fairly short, but covered with long hackles.

Body.—Fairly broad, square, and compact. *Breast :* Well rounded. *Back :* Moderately short, broad at shoulders, and tapered to the tail. *Wings :* Of moderate length, and carried close to the body.

Tail.—Of medium length, and carried well back.

Legs and Feet.—*Legs :* Of medium length, the shanks fine and free from feathering. *Toes :* Four on each foot, straight, and well spread.

Carriage.—Active and graceful.

Weight.—6 lb.

HEN

Except that the *Comb* falls gracefully over to either side of the face, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—5 lb.

COLOUR

THE BLACK

Beak : Dark blue or dark slate, the former preferred. *Eyes :* Black, or as dark as possible. *Comb and Wattles :* Bright red. *Face :* Sooty, especially dark around the eyes. *Lobes :* White, or white sanded with red, the former preferred. *Legs and Feet :* The same as the beak.

Plumage.—Black, with a bright green lustre.

THE WHITE

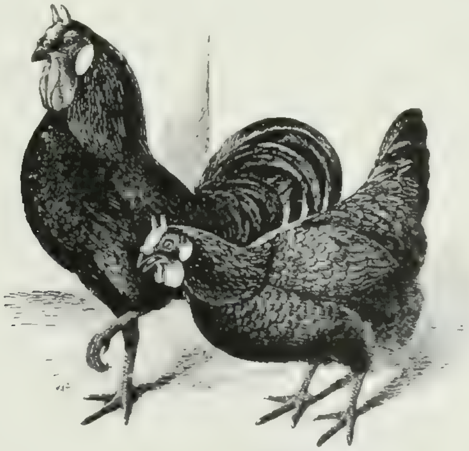
Head points : As in the Black. *Legs and Feet :* Dark blue.

Plumage.—Pure white, straw tinge objectionable.

SCALE OF POINTS

Type	40
Head : lobes, 10 ; eyes, 10 ; comb, 5	25
Colour	20
Legs and feet	15
	100

Serious defects : Comb too heavy or with side sprigs ; red eyes ; black, white, or yellow shanks and toes ; straw-coloured or other than black or white feathers ; high tail carriage ; any deformity. (NOTE.—Red lobes, although objectionable, cannot be considered as serious defects at present.—W. W. B.)



La Flèche.

CHAPTER XXXII

OTHER CONTINENTAL BREEDS

BESIDES the breeds generally recognised as French, and described in the last chapter, there are several known in other parts of Europe which are distinct enough to be worth description. We are only able to give details of those originating in Belgium, Holland, and Southern Russia, of which the Belgian breeds are longest and best known in this country. One of these, the Campine or Braekel fowl—for there can be no doubt that both form essentially one breed—has only lately attracted considerable attention, and acquired considerable popularity; it will be convenient therefore to describe it and other Belgian or Dutch breeds first, and afterwards the most distinctive Russian fowls.

Campines.

The fowls known as Campines are undoubtedly of great antiquity; and it is in fact quite evident, now we have them over here, that they exactly answer to the *G. turcica* or Turkish fowl of old Aldrovandus, which has been already alluded to in treating of Pencilled Hamburghs, and which is pictured as a single-combed breed, with pencilling like a Hamburgh's, and the cock's body pencilled like the hen's. Further, there are found both single and rose-combed Campines in Belgium, though single combs are adopted in England to keep the breed as distinct as possible; and we have said already that single combs still appear in Hamburghs, and that old representations of these also depict pencilled cocks as well as hens. All the evidence is convergent, and points to the breed here mentioned as being the original of the old Chittiprat or Everyday Layer, before the latter had been refined in head and pencilling, at the expense of some loss in size, hardihood, and prolificacy. It is as a hardy fowl and prolific layer that the old breed has been re-introduced into this country.

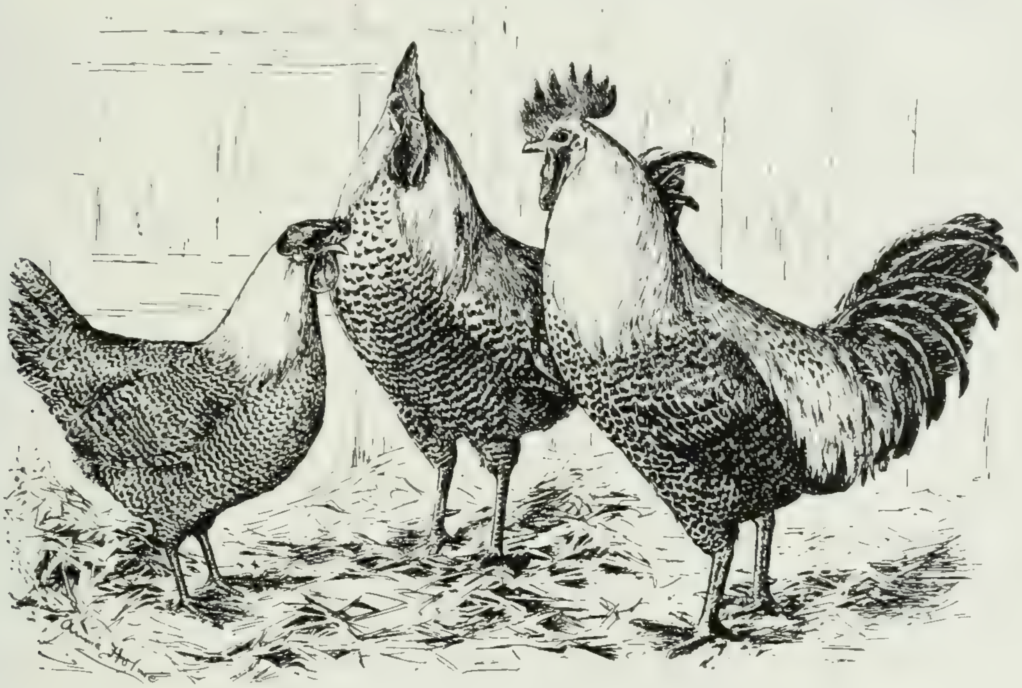
The following notes upon Campines were contributed to our last edition by Mr. Thomas B. Bracken, Slyne Road, Lancaster, one of the earliest exhibitors of the breed in this country.

"I myself remember my parents keeping the old Chittiprat, and although I cannot remember the points, I recognise a similarity to the present day Campines. My poultry runs adjoin the great North Road, at a point where a rise in the ground makes it convenient for pedestrians who are no longer young, or who carry too much adipose tissue, to take a view of the surrounding scenery; and in the summer time I hear very many expressions of admiration for my birds, the older generation calling them Chittiprats, Bolton Greys, etc. etc. Frequently I am asked what breed they are; I reply Campines (pronounced Kampeens), and it is very amusing to hear the result: Campions and Champions being the most familiar repetition, Campies with the long *i*, occasionally but very rarely indeed is it correctly repeated.

"I was led to take up Campines by reading an account of a tour through Belgium in June, 1897, by Mr. Edward Brown and Mr. A. F. Hunter (of *Farm Poultry*, Boston, U.S.A.), in which the wonderful laying qualities of the breed were referred to. Shortly afterwards I imported eggs and birds from the late M. Moons de Coen, Calmpthout, Antwerp, who was, I believe, the leading Belgian breeder of this variety.

"The Campine, as is now generally known, is a Belgian breed, and derives its name from a large district in Belgium, extending from Antwerp to Hasselt in Limbourg. The breed is undoubtedly a very old one; indeed, the people of the Campine district go so far as to say that when Julius Cæsar left their country, he took back to Rome a number of these fowls, which the Roman epicures pronounced 'food for the gods.' Be this as it may, when chickens six to seven weeks old, Campines are as plump as partridges, and remarkably good eating. The Belgians have, however, bred them chiefly with a view to quantity and size of eggs, and not for feather. The result is a remarkable layer of good-sized white eggs. I regret I have not been able to keep an exact record of quantity, but a friend of mine in the hilly district of north-west Westmorland wrote me in April, 1900, as follows: 'I have four pullets hatched middle of June, which commenced laying early in November, and have laid ever since; been getting three and four eggs daily, sometimes four per day five days in succession.'

"They are what I call a 'homely' breed, and with decent treatment readily eat out of the attendant's hand; and although when thoroughly alarmed they can fly a great height, I find in practice that 6-feet netting keeps them within bounds. They are non-sitters and remarkable foragers, so that on a free run they require very little assistance in the matter of food.



Silver Campines as exhibited in 1900.
(From a drawing kindly lent by Mr. T. B. Bracken.)

"The plumage of the hens is very similar to our Pencilled Hamburghs, but the pencilling is broader. In cocks the breast and wing-bar are pencilled like the hens, the back and saddle in most specimens being at present white. The main tail is black, and the sickles in the best specimens are edged with white or mackerel markings. The combs are single, erect in the cocks, and falling over in hens like a Leghorn's. After the plumage and smart, graceful carriage, the most striking characteristic is the dark, apparently black, full, prominent eye; when closely observed, however, it is found that the pupil only is black, the iris being a very dark brown.

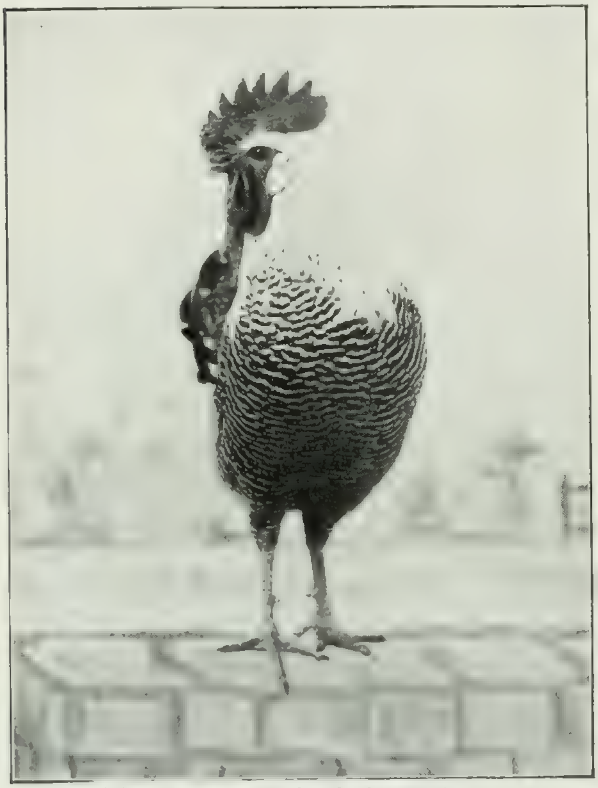
"The chicks are hardy, and feather quickly. I have had them successfully reared on a stiff clay, with an excess of moisture for weeks together. In a fairly extensive experience, they are the most precocious youngsters I have ever come across. When hatched in fine weather, I have had the cockerels crowing under five weeks. The colour, when hatched, of both Golds and Silvers, is dark brown, the Golds being a shade richer.

"In order to avoid that bane of so many otherwise good breeds, double mating, the Campine Club very wisely revised their standard, and made the plumage of cocks identical with that of hens; and, with a view to discourage the introduction of Hamburgh blood, have also made red eyes a disqualification. The question of broad *versus* narrow pencilling has not been discussed, but my own idea is to go for the broad markings. In this respect my second prize Palace cockerel excels my cup winner, the latter having narrow markings, though bred from the same pen.

"In regard to the two colours, Silvers and Golds, at present the Golden are a trifle smaller than the Silvers, but, generally speaking, they have whiter lobes. I find, however, that both my Golds and Silvers are increasing in size as well as improving in markings."

Writing in 1911, the Rev. E. Lewis Jones, of Heyope, Knighton, Radnorshire, hon. sec. of the Campine Club, kindly furnishes the following additional notes. The bird portrayed on this page is from his yards, that on p. 479 being the property of Mr. R. Edwards.

Origin.—Monsieur L. Vander-Snickt, the greatest Belgian authority on poultry, tells us that "these two breeds (Braekels and Campines) have been famous since the time of Charles V. for producing delicious milk chickens in winter, and in summer for the enormous number of cockerels (*poulets de grains*) which must be killed or caponised before they are four months old." Of their origin prior to that period we do not know anything with certainty, but Monsieur Vander-Snickt finds a resemblance in them to the *G. turcica* of Aldrovandus. How they were introduced into Belgium we do not know. Undoubtedly the Braekel and the Campine of Belgium originated from the same stock, but have now been modified by (a) environment and (b) the infusion of blood of the fowls that were there before. These two causes are, to my mind, sufficient to account for the differences and have been operative to produce them.


Silver Campine Cockerel (Front View).
(Selected to illustrate marking and type.)

History.—Undoubtedly Campines have been known in England since the beginning of the last century, and I have Mr. Edward Brown's authority for saying that "it is reasonable to assume that the original pencilled Hamburghs introduced were Campines." The first introduction then led to pencilled Hamburghs, the second introduction took place, as a result of Mr. Edward Brown's letters to the Press, between 1897 and 1899; the Campine Club was formed on Nov. 15, 1899, for "the purpose of bringing the wonderful economic properties of the Campine fowls prominently before the British poultrymen and to forward the interests of the breed generally." The early history was a brief popularity, so brief that in 1905 the breed and the club were practically dead.

In connection with this it is interesting to note that in the 'eighties Campines were introduced into America as Belgian Braekels, and that they had a place in the American standard, but the breed failed to become popular, and is no longer included in that standard. The revival in England coincides with the introduction of male birds marked like the females, and all signs point to the fact that the introduction of the English type of Campine cockerel will produce a revival in the States.

Description.—As originally imported the males had flowing white neck hackle, a white patch on the wing bow, white or slightly ticked saddle hackle and a black tail, the rest of the body being barred. The hen had white neck hackle, the rest of the body being very imperfectly barred, the greatest fault being "mossiness." It was clear that such a male could never breed pullets anything but "mossy," and so the club was faced with the problem of (a) either double mating, one pen to produce exhibition cockerels, and another to produce exhibition pullets, or (b) to make the male conform in body markings to the female. The club decided upon the latter course, and this decision led to the practical breaking up of the club. However, the production of the desired male and the breeding of exquisite females has put the club on its legs again.

The policy of the club for the last six years has been so to draw up its standard as to prevent crossing and thus keep the breed pure; it has also been the policy to discourage increase of size or the abnormal production of any point which would interfere with the wonderful economic qualities of the breed. In this we have succeeded, for our Campines are as hardy as ever, they lay as many, if not more, eggs in the year, and the size of the egg has been more than fully maintained.

The English type of Campine includes both Braekel and Campine of Belgium, ignoring their differences. It might be more accurate to say we are producing a composite bird out of these two, and in America they intend to do the same, modifying our type slightly.

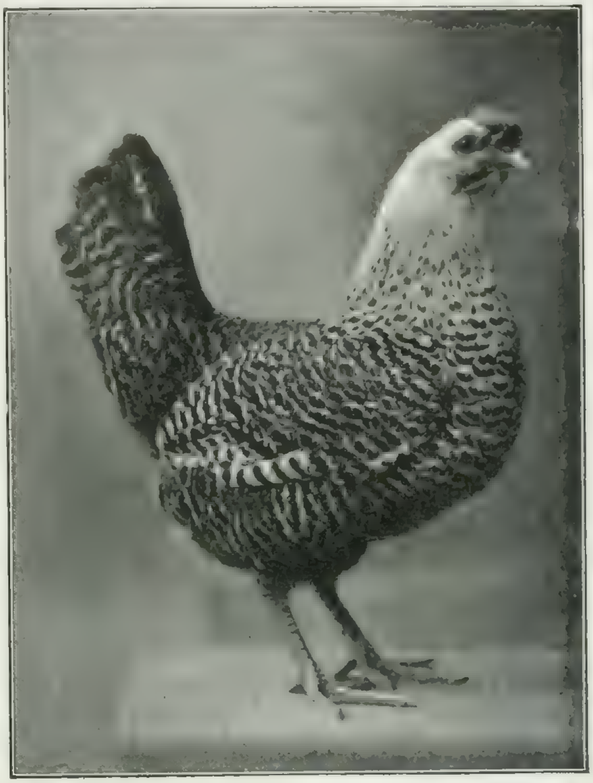
The cockerel has a medium sized, even comb with about five serrations, and the tip slightly following but standing clear of the nape of the neck. It should be fine, even, and upright without a thumb-mark in front, wide enough to be well set, and yet not so beefy as to appear ugly or to interfere with the comfort of the bird. The wattles are medium-sized and of fine texture. The earlobe satin white, smooth, not wrinkled, of moderate size; the beak should be horn colour and the eye black (though the iris is often dark brown). The neck hackle is silvery white, and should be as full and flowing as possible. The rest of the body is barred; the black bar should be about three times at least as wide as the white ground colour, the latter being wide enough to be seen at a distance, and not a cobweblike marking visible only when handled. The black should be pure black, free from grey and covered with a beautiful green sheen, which makes the bird (of a naturally gay carriage) look resplendent in the sunshine. The idea is that the markings should suggest rings round the body, the geometrical regularity being broken by the rounded white bar at the end of the feather. In the hen the comb may fall over, but should not be so large as to interfere with the bird's comfort. At the base of the comb of the female there is often a bluish zone. This is due to a pigment termed "negresse," and which is responsible for the delicate flavour of the Campine. The colour of the legs is leaden blue with horn toenails.

In England we have only the Silver and Gold Campines, but in Belgium they have some other varieties. The description of the Silver applies to the Gold, substituting gold ground colour for white.

Qualities.—The Campine is primarily a prolific layer of a large white egg, and it is more an "all the year round" layer than one who lays heavily at a certain season. As a table bird it is excellent in quality, and it has the merit of carrying the greater part of its flesh on the breast. It is small in bone, and consequently the ratio of flesh to offal is higher than in any other breed. Judged by weight only, it is not big enough for a table bird; but weight should not be the only consideration, as two Campine cockerels weighing 8 lbs. would feed more people and more satisfactorily than an 8 lb. cockerel, as weight means bone, which is expensive to build and useless on the table.

Campine cockerels are useful for crossing, as they improve the number and size of eggs, the quality of the flesh and the amount of meat on the breast. They also improve the hardiness of the progeny and the quickness with which they mature for market.

The weight of the egg is not less than 2 ozs., and ranges between 2 ozs. and 2¼ ozs. The colour is pure white and the flavour is delicate. Mr. Edward Brown in his "Report on the Poultry Industry in Belgium," says (on page 38), "The claim is made, however, that eighteen Braekel eggs give equal results in cake-making to twenty-two from any other breed."



Silver Campine Hen.

Campines are non-sitters. They are excellent foragers and find a great deal of their living on a free range. They are small eaters. They are tame birds, not at all shy or wild, they crowd round the attendant and impede his progress; if frightened they certainly can fly, but don't do so as a rule.

The chickens hatch out strong and are easily reared and feather quickly. They are very active. Care should be taken not to allow them to get into long grass when it rains, otherwise the mortality is heavy, as they go right into the middle of it to search for food and get wet to the skin, and wet is the worst enemy of all young life. They are very precocious. I have seen cockerels four to five weeks old attempting to crow. From the fifth week onwards they present a matured appearance, and those unacquainted with them think they are bantams, so grown up they look. The pullets also mature quickly and begin to lay from four to four and a half months old.

The breed is hardy, but it requires to be well-housed in a well-ventilated house. It does not flourish when the sleeping accommodation is not sufficient. Those that have flourished best with me have roosted in the apple trees.

In type I prefer to see a wedge-shaped bird with a well-rounded breast, the bird presenting a gay and fine appearance and devoid of all coarseness. The tail should be well furnished. the two long sickle feathers standing out at an angle of forty-five degrees from the body. There should also be a full supply of saddle hackle.

Exhibition.—There is no difficulty in exhibiting them, as they are always in condition and rarely want washing. Three days in the pen is sufficient to get them trained for show. Cockerels and pullets can be bred from the same pen. The first cockerel and first pullet at both Dairy and Palace, 1908, were brother and sister. The birds do not look so striking in the show pen as they do on a green run or even in the hand.

The difficulty in breeding exhibition specimens is to combine in one and the same bird (a) good neck hackle, (b) good breast, and (c) good markings on the upper part of the body. It is easy to get any two, but very difficult to get all three.

A great advance has been made in the last four years, but there are still a great many difficulties to overcome, and the Campine offers a fair field to those who love breeding. In a finished breed the novice stands no chance against the experienced breeder, but with the breed in its present state luck may come in and help the novice and put him on equal terms with the most expert breeders; this I have seen happen many a time.

Mating.—Advice on mating must always remain a difficult matter as long as there is more than one way of obtaining the same result. I can only just give a few hints as to how to proceed. First select the male; it is the easiest (if not the only) way to determine first on the head of the pen. See he has the right head points. Foremost see he is pure in colour, black being black and white white, with as much green lustre as possible. Let there be no glaring fault, as red eye, for instance. Find out his weak points, and see the hens are strong in these points. Get well developed hens and get them as regularly marked as possible, and get those that are most free from mossiness and have the best barred tips to their feathers. Working on these lines, the novice will not go far wrong, and in a few years should be able to pick out his breeders instinctively.

The following is the Poultry Club Standard for Campines:—

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Moderately long and deep, and inclined to width. *Beak:* Rather short. *Eyes:* Prominent. *Comb:* Single, of medium size, upright, evenly serrated, free from excrescences, the back carried well out but clear of the neck. *Face:* Smooth. *Ear-lobes:* Of medium size, inclined to almond shape, and free from wrinkles. *Wattles:* Fairly long in proportion to the comb, and of fine texture.

Neck.—Of medium length, and well furnished with hackle.

Body.—Broad, narrowing to the tail, close and compact, rather long back, full and round breast, large and neatly tucked wings.

Tail.—Of good length, carried well out from the body, and with broad and plentiful sickles and secondaries.

Legs and Feet.—*Legs:* Of medium length, and shanks free of feathers. *Toes:* Four on each foot, slender and well spread.

Carriage.—Alert and graceful.

Weight.—7 lb.

HEN

With the exception of the *Comb*, which falls over one side of the face, the general characteristics are similar to those of the cock, allowing for the natural sexual differences.

Weight.—5 lb.

COLOUR

Beak: Horn. *Eyes:* Iris, dark brown; pupil, black. *Comb, Face, and Wattles:* Bright red. *Ear-lobes:* White. *Legs and Feet:* Leaden blue; toe-nails, horn.

THE SILVER

Plumage.—*Head and Neck-hackle:* Pure white. *Remainder of Plumage:* Ground colour pure white, and barring pure black with rich beetle-green sheen, every feather being barred in a transverse direction with the end white, the bars clear and with well defined edges, running across the feather so as to form, as near as possible, rings around the body, and three times the width of the ground (white) colour. On the breast and under-parts of the body the barrings should be straight or slightly curved, but on the back, the shoulders, the saddle hackle, and the tail of a V-shaped pattern. The cock should be furnished with properly developed saddle hackles.

THE GOLD

Plumage.—*Head and Neck hackle :* Rich gold, and not washed-out yellow. *Remainder of Plumage :* Ground colour rich gold, and barring pure black with rich beetle-green sheen, and markings as in the Silver.

SCALE OF POINTS

Markings	30
Colour : neck-hackle, 12 ; sheen, 10	22
Size	10
Condition	10
Tail (development and carriage)..	8
Comb..	5
Eyes	5
Lobes..	5
Legs and feet	5
	100

Serious defects : Even barring ; pencilled ground colour ; sprigs on comb ; legs other than leaden blue ; white in face ; red eyes ; feather or fluff on shanks.

Bredas or Gueldres.

A breed known as Gueldres or Bredas, the former name being given to the Cuckoo variety, has long been known in Belgium, the Netherlands, and some parts of northern France. It was much praised by M. Jacque and other early French writers, and was introduced into England by Mr. Geyelin and Mr. Schröder, in the days of the disastrous National Poultry Company. It was also at one time considerably bred in the United States ; but appears to have lost ground of late years everywhere, being elbowed out, on the Continent as well as here, by more recent favourites. The breed has a small crest, and slightly feathered rather short legs, but its chief peculiarity is an entire absence of comb, there being instead a depression in the red skin just over the cavernous nostrils, and behind the barest little ridge of flesh. Fig. 133 shows this formation, and the entire head of a Breda fowl, as drawn by M. Jacque so far back as 1864. The breed is reported as hardy, good in flesh, and a fairly good layer, but not much of a sitter. (See also p. 483.)

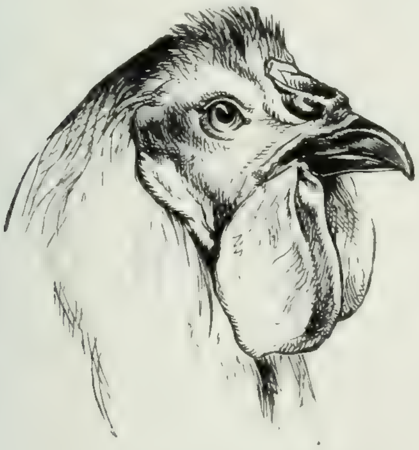


Fig. 133.—Head of Breda Cock.

We are indebted to Mr. Edward Brown, F.L.S., who has travelled much upon the Continent, for the following notes and descriptions of the following other breeds in Belgium and Russia.

Coucou de Malines.

"The leading variety of Belgian fowls for table purposes is the Coucou de Malines, which is bred extensively in Brabant, to the north of the city of Malines, and fatted in the villages to the west of Malines, chiefly in the district around Merchtem and Opwyck, in Flanders. These fowls when dead are known under the name of *Poules des Bruxelles*. It may be explained that the fattening is not restricted to the district where the birds are chiefly reared, the breeders and fatteners meeting at a large market which has been established at Londerzeel. In many respects the Coucou de Malines resembles the Plymouth Rock. It is generally of the Asiatic type—that is, heavy in build, substantial in bone, upright in carriage, and with a small tail, though this is not so small as that of the Brahma and Cochin. The males weigh about 9 lbs. unfatted. The legs are stout and rather long, the latter being flesh-coloured or rose-white, and ornamented on the outer side with small feathers ; the tail is short and thick ; the head stout, surmounted by a single comb, small in size and upright in both sexes, with clear indentations ; the wattles and earlobes are red ; the neck is thick and short, the body massive, thick-set, and the breast prominent. There are two colours, namely, what is known as cuckoo and the white ; the former are chiefly met with, and the whites appear to be a sport therefrom. Comparatively few of the latter are bred, but they are increasing in favour. The hen is a fair layer, but the eggs—as is usual in the case of birds of the Asiatic type—are rather small as compared with the size of the birds from which they are produced. The eggs are well tinted, and are usually short in comparison with their size. The hens are excellent sitters, and make very good mothers, although they are somewhat heavy.

"The Malines fowl is quiet in temperament, and a very good fattener. The flesh is excellent in quality, but the birds, by reason of their weight of bone, are not very rapid growers, and I do not think they are equal to the best French and English so far as flesh properties are concerned. From such evidence as can be obtained, it would appear that this breed owes its origin to the Brahma engrafted upon the common fowl of the country, though such a statement scarcely affords an explanation as to the origin of the cuckoo plumage, and it is probable that some other influence has been at work in this direction. As cuckoo plumage is practically a mixture of black and white, frequently appearing in other breeds, it may be that the result was accidental in the first place, and the fixing of the type due to careful selection. The breed is well suited to the district in which it is kept, and meets that demand for large birds with good flesh qualities which is found in nearly all countries. My experience has been that the Coucou de Malines does very well in other places. I have had specimens over some time, and they have succeeded very satisfactorily.

The Poultry Club Standard for Malines is as follows:—

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Strong, but not thick. *Beak :* Strong and stout, and of medium length. *Eyes :* Full and intelligent. *Comb :* Single, of medium size, straight and upright, with about five serrations. *Face :* Smooth. *Ear-lobes :* Rather long. *Wattles :* Of medium length.

Neck.—Strong, not too short, rather thick, and profusely covered with rather short hackle feathers.

Body.—*Breast :* Deep and broad. *Back :* Long, broad, and flat, carried horizontally and not sloping. *Wings :* Rather short and well tucked up.

Tail.—Short, and carried half horizontally.

Legs and Feet.—*Legs :* Fairly long, strong, the shanks and feet feathered to the outer toe, but not heavily feathered. *Toes :* Four on each foot, fairly long, strong, straight, and well spread.

Carriage.—Upright, but not with a sloping back.

Weight.—9 lb. to 10 lb.

HEN

Except that the *Legs* are rather short, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—7 lb. to 8 lb.

COLOUR

THE CUCKOO

Beak : White or horn. *Eyes :* Red or bright orange. *Comb, Face, Wattles, and Ear-lobes :* Red. *Legs and Feet :* White.

Plumage.—Blue-white ground, each feather barred across with bands of blue-black, the blue reflection disappearing the second year.

OTHER VARIETIES

Among other varieties recognised are Black, Ermine, Gilded Black, Gilded Cuckoo, Silvered Black, and White, and the "Turkey-headed" (triple comb) in all colours; but they are not exhibited in sufficient numbers in this country to warrant description.

SCALE OF POINTS

Type	25
Size and weight	20
Colour and marking	15
Carriage	10
Breast and back	10
Comb, ear-lobes, and wattles	10
Beak and neck	5
Legs and feet	5
	100

Serious defects : Lack of size and weight; back sloping or not flat; squirrel tail; overhanging comb; white ear-lobes; yellow legs; bronze feathers.

Bruges.

"The breed known as the Bruges fowl is frequently called the *Combattant du Nord*, and it is met with to a moderate extent in Belgium and the French-speaking districts of Flanders. It is in appearance distinctly of the Game type, and in some cases it is used for fighting purposes. The appearance, however, is more like the Indian Game or the Malay, in that it is much heavier in build than the majority of our Game fowls. The comb is single and very small, the colour being deep red, as is that of the wattles and earlobes; the tail is horizontal, the legs and feet are lead colour. In size, carriage, shape, and comb, the breed distinctly follows the Malay, whilst by its activity, the colour of the plumage, and general instincts, it is more nearly allied to the English Game. It is a very hardy breed, easily reared; it is a poor layer and uncertain as a sitter. Like most of the Game fowls, the rapidity of growth and quality of flesh are strikingly in its favour, and the breed is used to a considerable extent for table purposes.

ARDENNES

The southern sections of Belgium, that is the Ardenne region, which consists of a high hilly country, has a breed known under this name, light in body, very active and hardy, and thus able to meet the conditions there prevailing, which require a bird well able to find a large part of its nutrition. They are gamey in appearance, flat in front, have large wings and full tail. The legs are of medium length, blue-grey in colour, and with five toes on each foot. The plumage is similar to that of Black-red Game in the cocks, but very dark in hens. The head is strong, with a small single comb, eye red, and face covered with fine feathers. Although these birds are small-medium in size, they are said to have excellent flesh qualities, but the meat is hard and the birds require to be well hung after they are killed. As egg producers the hens are moderate so far as number is concerned, but these are of a fair size and said to be excellent in flavour. The Ardenne fowls are wild in temperament, and demand freedom of range.

BRABANTS

Throughout the Netherlands, that is Holland and Belgium, this type of fowl is found to a considerable extent, but it is only within recent years that it has received special attention. Without being heavy in bone the body is large and roomy, showing considerable posterior development with medium length of neck and legs, and indicative of good laying quality. The Brabanconne is a crested race, which crest is often more developed in cocks than in hens. The crest, however, is not globular as in other breeds with which we are familiar, but somewhat flat, and the beard or muffs are also small. The comb is small and single. The majority of these fowls are black in plumage, though in some an admixture of red is found. The legs and feet are slate blue. The main quality is egg production, these being large in size and white in shell, and the hens are non-sitters. They are largely found in the Walloon districts of southern Belgium.

Other Belgian races are the Herve, a small active breed found on the high tableland of that name, and excellent layers; the Huttegem, a heavy fowl used much for hatching ducklings, as they are early and determined sitters; and the Antwerp Brahma, evidently due to a cross with the Shanghai or native races. Bantams are also largely kept in Belgium both for their ornamental and practical qualities.

DUTCH FOWLS

In Holland several breeds of fowls exist which have, with one exception, been unknown to breeders in other countries, and even in the Netherlands have not received much attention until recent years. The exception is that to which the name is applied in England of the White-crested Black Polish, though it is not a variety of the Polish or Poland fowl. The name given to it upon the Continent is Hollandais, which correctly reveals the country of origin. That breed is dealt with elsewhere. Further, it is of interest to note that the Pencilled Hamburghs undoubtedly first came from North Holland, where there is a breed called Friesland, which is identical as to comb and plumage with the Hamburgh, but larger in size of body. With that it is unnecessary to do more than make this mention, as later observations have shown its relationship to the Pencilled Hamburgh. Probably the original spangled Hamburghs were due to an earlier importation from Holland. The chief breeds other than those mentioned are briefly referred to below.

BREDA

At one period this breed, which takes its name from a Dutch town, was widely distributed in south Holland. A large fowl, full in breast, somewhat long in leg, and on broad lines, it has considerable affinity with Asiatic types. There are four varieties, namely, Cuckoo, Black, White and Blue. The peculiar features are that it has a small almost rudimentary comb, behind which is a small crest of short feathers falling backwards, white earlobes, and full hackles. The legs and feet are slaty blue, and the flesh white. It is very hardy and suitable for lowlying lands; the hens are prolific layers of large eggs, poor sitters and mothers, and being slow growers are found useful for winter birds, as they fatten well. They can be kept successfully in confinement, and are further referred to on p. 481.

OWL-BEARDED

The native name is Uilebaard. It would appear that this race is closely allied to a German breed known as the Bearded Thuringian, kept in the Hartz Mountains. They are small in size of body, which is full and round, with short back and full tail. The comb is small and horned, and the wattles are also small. The cheeks and throat are covered with a thick, full black beard. The legs are medium in length, and the beak and toenails white. A good forager, it is a capital layer, and carries a fair amount of white flesh. There are several varieties, namely, Black, White, Gold-laced, and Silver-laced.

DRENTE

Only one other breed need be named, the Drentishe fowl, found in the Dutch sandy province of that name. It is small in size, but very long in body, an excellent layer, and by its foraging qualities eminently suited to a poor country. There are several varieties, but these are unfixed and uncertain.

RUSSIAN FOWLS

"Very little has been known as to the fowls chiefly met with in Russia. From time to time reference has been made in various books to fowls which were called 'Russian,' having certain special characteristics, but until the Poultry Exhibition held at St. Petersburg in 1899 I never met with any of these birds.

Orloffs.

"In an interesting paper which was read at the Congress held in the Russian capital, it was stated that of the breeds of Russian fowls the first place must be accorded to those called Orloff. The best specimens of this race are all of a very large size, in general the adult cock weighing about 10 lbs., but in some cases they reach 12 lbs. and more, the hens being about 2 lbs. less. The head of these birds is large, nearly round, without the slightest sign of crest, but with heavy whiskers and beard. The hackles swell out below the head into almost a spherical protuberance, but at the base of the neck the feathers lie close, so that the neck appears thinner at the shoulders than above. In body it is large, closely feathered, and very deceptive in the actual weight; in appearance it is not unlike the Indian Game in some respects, although it is not quite so wide in body or heavy in bone, and has a distinct appearance of being deeper in breast, though this is partially due to the fact that the breast is longer and more prominent in front than in the case of the Indian Game. Still it follows that type very largely, and with the exception of the muffs, the head has a similar appearance. Good specimens are rather difficult to obtain. Various suggestions have been made as to the origin of the breed, which is not widely distributed. It has been suggested that it was due to the crossing of the Malay upon the Faverolles or Mantes fowl; but this is denied, and the fact that birds of the Orloff type have been met with for a longer period of time than the Faverolles or Mantes fowls appear to have been known, would indicate that this could not be the origin. As one Russian writer says, the difference between the Orloff and all other species is chiefly in the conformation of the head, which is round and large, the frontal bone being particularly prominent. The conformation of the beak is equally remarkable, no other species having the beak curled as sharply, and which is very evident even in the chickens. The following quotation from a paper read at the St. Petersburg Congress by M. Houdekoff affords all the information obtainable at present.

"'The Orloff fowl has received this name from the fact that it is supposed to have been introduced by Count Orloff-Tschesmensky. This is not, however, very probable, because it was well known by Russians before the time of Count Orloff. We find a description in the work of an unknown writer published in 1774, where it is named "Chlianskaia." Breeders knew the race under the latter denomination until a much later period. Now, without any reason, it is customary to call them the Orloff. The more probable supposition is that they were brought prominently forward by the celebrated horse-breeder, Count Orloff-Tschesmensky, and principally in the province of Ghilan. But he did not give them the name. We may ask whether there are not a few races of domestic fowls, yet unknown, in the centre of Asia? That country has been explored in many parts to a small extent, and it is not impossible that it contains many surprises. It may be that this race of poultry had its origin there, and was not produced in Russia. But we have made it known first to Europe and America.'

"My own observations are that the Orloff is not widely distributed, and it was with considerable difficulty that I secured a trio. Unfortunately both the hens died before they bred, and I have not yet succeeded in securing other specimens. Hence I have no experience as to their qualities, but they would appear to me to be moderate layers, but good in table properties. There are three colours: 1st, dark mahogany; 2nd, speckled; 3rd, white. The first named is the most wonderful in sheen and colour of any fowls I have seen.

Pavloff.

"A very interesting class of fowl is that called the Pavloff, and so far as I can learn it is really the progenitor of what we now call the Polish. There were quite a number of these birds exhibited at the St. Petersburg show, both by Russians and Germans, and they are evidently found in the border sections of these two countries. They differ, however, very distinctly from the Western European Polish, but some of the same characteristics are present, though in a less degree. These birds are much smaller than our Polish, and have feathers upon the legs, in some cases being very thickly feathered, but they are also crested, though the crests are small and differ distinctly from the Polish in shape. As is well known, the crest of the Polish fowls is large and round, whereas these are small. In some cases the crest feathers stand almost erect upon the head; in others there is a transverse line on the top of the head, part of the feathers falling back and the others to the front; a third form was that the larger number of the feathers fall forward over the face like a fringe, with only a few standing up behind, and a fourth had the majority falling behind like a lady's veil thrown back, with a few in front. In no case do the feathers cover the eyes, as is the case with our Polish fowl, and not only can we trace to this breed the Polish, but it is also more than probable that the Sultans, which came to us from Turkey, are sports therefrom. The beards and whiskers are very thick, quite covering the ear-lobes.

"In respect to this breed M. Houdekoff says: 'There are in Russia some crested and muffled fowls which are known under the name of Pavloff. These fowls are original, and have definite characters which distinguish them. They have received the name "Pavloff, because they are bred principally at Pavlovsk in the Government of Nijni-Novgorod, where, it is said, they were introduced by the Empress Catherine II. There are two varieties—the Gold and the Silver. Another breed is called the Russian Dutch, and this is similar to the White-crested Black Polish, but has not so large crest, and has a great deal of red in the plumage. The plumage of the others is as in golden and silver Spangled Hamburghs, the ground-colour being golden-bay or silver-white, the feathers ending in both cases with a round, black spangle. The legs and feet are slaty blue.'"

Russian statements respecting the antiquity of the above breeds may perhaps be received with some scepticism. The photographs which we have seen of Orloffs irresistibly suggest a cross of Indian Game; and all known of the spread of breeds of poultry, makes it far more probable that the great Polish race should have spread from south to north than from north to south. Mr. Brown also forwards Standards published by the Russian Poultry Society of four other breeds, of which he has no personal knowledge, and which did not appear at the St. Petersburg Exhibition of 1899. They are named as Ushanki, Russian Crested, Siberian Feather-footed, and Rose-combed. Except that the Feather-footed seems in many points to resemble the Sultan, it is difficult to gather any definite ideas from these descriptions beyond the general prevalence (except in the Rose-combed) of crest and whiskers among Russian fowls.

We believe that there are one or two breeds with some character in Germany, but only the Lakenvelder presently described has found any recognition in England. A very curious but quite minor breed known in Austria is mentioned in the next chapter. The tendency in Scandinavia is more and more to import from southern Europe, and on the Continent generally to cross with stock from England; in fact, all the recent history of Continental poultry goes to show the increasing value set there upon that stock of English breeders, which some writers have persisted in representing as so inferior to French and Belgian races. Perhaps the most likely source of anything really new in the poultry world is now the southern and eastern continent of Africa, and it is by no means improbable that the opening up of that country may ere long introduce something in the way of novelty and at the same time really characteristic.

CHAPTER XXXIII.

UNCLASSED BREEDS OF POULTRY.

THERE are several fairly old and well-known breeds which can hardly be classed under any definite heading; and others less known, which it is also desirable to gather together in such a chapter as this. Most exhibitions have, besides classes for the usual breeds, one for "Any Other Variety," which has in its time done yeoman service to the poultry world. Brahmas and French fowls made their earlier appearances in it, till strong enough to claim classes of their own; it is to be regretted that the converse is now the case, and that such old and once popular breeds as Spanish and Polish too often lately have found their only chance of a prize in this refuge for the destitute.

Such facts suggest that the "Any Other Variety" class ought to have more careful attention than it often receives. And especially it is desirable, now that really old standard breeds so often invade it, to provide prizes for a greater number of *varieties* in the class. To add to prizes is the obvious remedy; but where funds forbid that, we can but repeat an old suggestion, that in this one case it is desirable to depart from the single-bird system, and in place of three prizes each for males and females, to offer two firsts, two seconds, and two thirds for *pairs*. More breeds would then have chance of recognition.

In the paragraphs which follow we have placed earlier varieties or breeds most worthy of consideration alphabetically, then the recently introduced Lakenvelders and Sumatras, and collected those of minor interest together at the close.

ALBIONS.

This useful variety of fowls was originated in the county of Sussex, Mr. Godfrey Shaw, of Scaynes Hill, near Haywards Heath, having, we believe, bred the first pen of them about the year 1897. They were produced, as stated in a former chapter, by selecting and breeding together the whitest of the Sussex farmyard stock, and, of course, much false colour had to be bred out of the earlier produce. Classes were provided for them at several shows, and some of the birds which appeared in them showed traces of the White Plymouth Rock, in a coarser and somewhat flat head, and coarser skin. This might possibly come from Rock blood already absorbed in local stock; but if real attempt be made to cultivate such a breed, it is highly desirable that the blood should be confined to that Sussex type which has proved so well adapted for useful purposes.

The Albion may be described briefly as an all-white fowl, excepting the head points. It should have white beak, white legs, clear white plumage. A great point is and should be, smallness of bone, and some closeness of feather, no apparent size being lost in fluff. In weight it is about the same as Rocks and Orpingtons, all the really *market* breeds tending to nearly the same average weight. The shape should be rather long, somewhat resembling the Dorking, or American type of Rock. The bird might be described as equivalent to a small-boned white Dorking, without the fifth toe or the difficulty of a rose comb, but it is doubtful if it becomes popular as a fancier's fowl—few white breeds are, for obvious reasons.

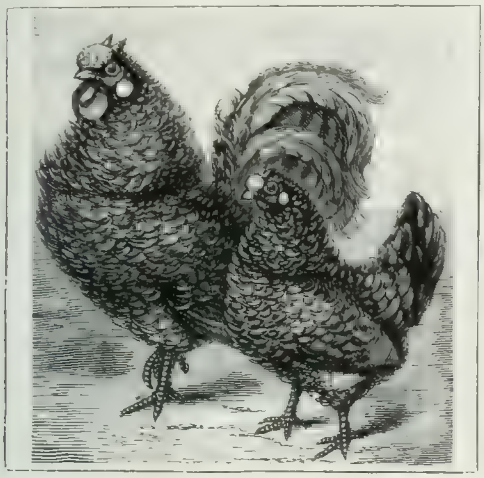
Both Mr. Shaw and Mr. Richardson, who has also shown Albions, report the birds as good layers of fair-sized tinted eggs, hardy, maturing fast as chickens, and easily reared in any weather, even on clay land. At ten to fourteen weeks they are ready to go in the fattening pens, and the white plumage makes the carcase specially attractive at the season when pin-feather abounds on the skin, whilst the feathers are also worth much more per lb. to sell to manufacturers.

As stated on pp. 298-9, the powerful Orpington interest quickly appropriated this breed as white Orpingtons, and this note is now of historical interest only.

FRIZZLED FOWLS

The characteristic of these birds is that each feather is curled back, as if they had been stroked the wrong way, leaving the curl permanent. The tail feathers cannot, of course, be thus curled, but the webs are also peculiarly fashioned, in a way difficult to describe. The whole appearance is very grotesque and quaint; people differ as to whether it is attractive.

Other points vary at times, but most usually the birds have rose-combs, and rather short dark legs, the plumage being of all colours. Years ago the most common colour was white; we have also seen all black: at present the majority appear brown or partridge. Temminck says that the breed was in his time found throughout Southern Asia and the Eastern Archipelago; it is well known in Ceylon and is very common in the Mauritius. That fowls so widely spread should have so much in common is remarkable.



Frizzled Fowls.

Contrary to the common belief, every breeder who has had real experience with the Frizzled Fowl, that we have yet met with, pronounces it distinctly hardy. Mrs. Taylor, of Ardgillan Castle, in Ireland, reported to us in 1872 that her Frizzles were the first to moult (often featherless by the middle of June) and the first to lay in the autumn. She found them excellent mothers, and more tender for the table than any other poultry she had experience of, even two-year-old birds being good, and white in flesh. They are very small in bone also. Though good mothers when they did sit, this was very seldom. She found the chicks hardy and easily reared, but slow in feathering, and requiring in consequence long brooding; but the plumage did not harbour vermin nearly so much as that of other fowls. The weights were then about 5 lbs. for cocks and 4 lbs. for the hens. Lately there has been a tendency to breed them small, till they at last found their way among the Bantams, and will be found again under that section of this work.

In breeding Frizzles for exhibition, almost the only point to look to (besides colour, if the latter be a self-colour) is perfection throughout the bird of the curled or frizzled character. Any tendency to ordinary or natural character, in any part of the body, should be discarded. Some birds also seem to "show" the frizzle better than others, and these are to be preferred, since judging of this variety, wherever it has a chance, is very much a matter of first impression.

JAVAS

The Black Java has been described in Dr. Bennett's and several other American poultry books from 1850 onwards, and some eighteen or twenty years later, it undoubtedly shared in the production of the Plymouth Rock; but we cannot hear of any being imported into England before 1885, when pens were obtained by Mr. Joseph Pettipher and several other fanciers. The variety seemed likely at one time to meet the views of those who wanted a large black fowl, but did not care for the very scanty leg-feathering of the Langshan. The clean-legged Orpington or Langshan, however, ultimately took that place, and interfered with any such prospects.

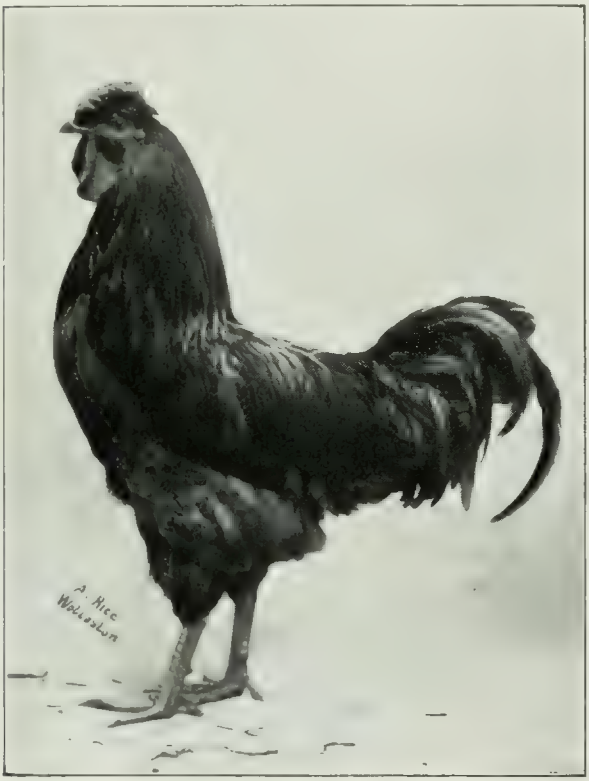
Yet it is a handsome and "distinctive" fowl. It is of the large type, the cocks reaching 10 lbs. and the hens 8 lbs., but average weights in England have been a pound less than this. The plumage is close, of a very glossy black all over, with green reflections. The legs are black also, with generally a yellow shade under the feet, and a tendency to get rather willow with age; but black throughout is to be preferred, and is often found. The ear-lobes are red, and there are distinctive points about both the eye and the comb; in our own opinion these are the most truly characteristic points of the fowl. The latter is single, rather small, but somewhat thick at the base, and in the main evenly serrated; but the serrations commence farther behind the beak than usual, having a kind of smooth edge first. This should be recognised as the typical and proper "Java comb," and carefully preserved. The eye stands alone, so far as we have observed, except in a few Langshans. It is brown, very large and full, and of a peculiarly soft and yet sprightly expression, difficult to describe. The body of the fowl should be full and deep, the legs only medium in length, the cock's tail rather full and flowing, but not squirrel-fashion.

Economically, the Java is very hardy, and a good layer, the eggs being coloured. The meat is very white and juicy, exactly resembling that of the Langshan, with which breed there is an obvious similarity. The hens are clever sitters and good mothers.

Like all other black fowls, the Java "sports" occasionally into white. From some of these sports a white Java has been produced in the United States; and from others, or by crossing these whites with the black, a mottled colour, much resembling that of the Houdan.

THE RHODE ISLAND RED.

It would appear, from available data, that this distinctly useful and beautiful fowl had its origin some half a century ago in a cross between the old Shanghai, the Chittagong, and the Red Malay, the males of those old breeds being mated with the female fowls already existing at Little Compton, Rhode Island, the most extensive of the group of isles situated in the famous Narragansett Bay, the foreign poultry having been undoubtedly brought to Rhode by the vessels plying to the island.



Rhode Island Red Cock.
(The property of Mrs. F. Cooper, Brailsford, Derby.)

The American Standard expresses the belief that the Rhode Island Red "originated from crosses of the Asiatics, Mediterraneans, and Games," and it is stated on good authority that the brown Leghorn entered largely into the composition of later types. Be that as it may, the present-day Rhode Island Red is the result of fifty years of out-crossing, hence the difficulty still experienced to breed the fowl true to colour. That the object of the old farmers of Rhode Island was, from the commencement, to produce a fowl conforming to specified pure-breed characteristics may be dismissed as being highly improbable, since they apparently simply strove for the elimination of feathered legs, and the producton of a bird having a "carcass" that found a ready sale in the Boston and other markets; and it was not until the fancier turned his attention to the fowl that it took on some resemblance of definite form.

Originally the Rhode Island Red rejoiced in the cognomen of the "Billy Tripp" and "John Macomber" fowl, a fact that was alluded to in a report issued by the Rhode Island Experiment Station in 1901. Writing in that publication, Captain B. E. Tripp, son of the original William Tripp, says: "To begin with, as far back as 1854 John Macomber, of Westport (living near what is now called Central Village, but then called Westport townhouse), and my father, William Tripp, both of them, ran teams to New Bedford as marketmen. They took the matter in hand to see if they could not, by crossing different strains of fowls, get better layers than the fowls in the surrounding country, and also better looking poultry for the market. The result of their trials was the production of the so-called Rhode Island Reds of to-day. Previous to that they were called the 'John Macomber' or the 'Tripp' fowls." It will, therefore, be gathered that the Rhode Island Red was a local race of poultry found exclusively in Rhode Island, produced by the farmers themselves without any definite breeding, and from uncertain and probably various materials. Some of the birds were smooth-legged, some slightly feathered, a few more heavily feathered; and single, rose, and pea-combs were found. This local stock was very hardy, very prolific, and good for table according to American ideas; and in 1879 or 1880 a Mr. Jenny seems to have exhibited them under their present name at a show in Southern Massachusetts. Subsequently they were written of as "Reds" and as "Golden Buffs" Dr. Aldrich staging them under the latter name at the show of the Rhode Island Poultry Association in 1891; the old and previous name of Rhode Island Reds only re-appearing at another show held in the island in 1895, when a Mr. Browning, of Natick, exhibited specimens under that name.

Although the Rhode Island Red has for many years flourished in America as an exhibition fowl, where a club was formed for it in 1898, and an attempt was made to popularise it in this country in 1901-2, it was not until 1904 that the single-comb variety was recognised by the American Poultry Association, and 1906 that the rose-comb variety was admitted to the same association's Standard of Perfection. In August, 1909, the British Rhode Island Red Club was established; and since that date the breed in whose interests it exist has increased in popular esteem with wonderful rapidity. The club in 1910 consisted of 116 members, and at its second annual show, held in Sheffield in December, 1910, there were no less than 136 entries in the six classes provided for the birds; and it is not too much to remark that the breed has by no means attained to the zenith of its vogue in the British Isles.

By the Standard of the Club, both rose combs and single combs are allowed. Colour was formerly the most important consideration, but at the general meeting held in Sheffield at the end of 1910 it was decided to allot 30 points for shape and 25 points for colour. The body should be long, broad, and deep (especially being long in keel), and therefore oblong in appearance; neck of medium length and carried slightly forward—it is covered with a full hackle which comes over the shoulders, but is not too loosely feathered; the thighs and shanks are of medium length, the former being large and the latter well rounded and smooth. The body is longer and wider than the accepted Rock style, and much longer in keel and carried less upright than the Wyandotte type. The beak is reddish horn or yellow, the eyes red, wattles and earlobes medium size and red. The standard for colour is purposely so drawn as to recognise darker colour in the cocks and avoid double matings for securing similar colours. The cock's colour is rich, brilliant red, with back and wing bows darker red; tail black, which is also allowed in the concealed feathers of the wing; the under-colour lighter red or rich salmon, free from slate or grey. The hen is lighter, of golden red surface colour, with black tail, and the lower end of the hackle tipped with black, under-colour as in the cock. The shanks are clean, and rich yellow or red horn colour. The standard weights are 8½ lbs. for cocks and 7½ lbs. for cockerels, 6½ lbs. for hens, and 5 lbs. for pullets. The disqualifications in show birds are feathers or down on the shanks, plucked legs, white feathers in outer plumage, ear-lobe showing more than one-half the surface permanently white. This does not mean the pale ear-lobe, but the enamelled white, sprigs or bad lop in single combs, shanks or feet other than yellow or red-horn colour, and more or less than four toes on either foot, entire absence of main tail feathers, two absolutely white (so-called wall or fish) eyes, wry or squirrel tails, and deformities or "missing" feathers, while a pendulous crop shall be cut hard. Faults to be avoided are fluffy or Cochin plumage, or Cochin cushions on females, light yellow bills or black in bill, pearl eyes, long spike to rose combs, high or upright tails, tendency to green in shanks. The Standard further directs attention to the fact that apparent vigour is to be regarded with the consideration of shape. This being a utility breed, hardiness is of vital importance.

That the Rhode Island Red is a good and useful fowl there is no doubt; and it is interesting to know that it has been found possible to cultivate and exhibit it upon utility lines, and to keep it distinct, in a form that could be recognised by the American Poultry Association. The latest edition of the Poultry Club Standards does not include a scale of points for the Rhode Island Red, but it may be mentioned that the British Club has adopted the standard affected by the American Rhode Island Club, so that it may be possible to breed the fowls in both countries on similar lines. So far the American product appears to be more uniform and brilliant in colour, and larger, than the British variety. A typical Rhode Island Red cock is shown in the photograph of "Fearless" on p. 488.*

SCOTCH DUMPIES.

These fowls are of considerable antiquity in Scotland, of how great it is impossible to discover; and they have been known in England since 1852, when the late Mr. John Fairlie introduced them into his yards near Newmarket. They were also called Bakies, Golaighs, and by other synonyms. About 1870 they appeared nearly extinct, and Mr. Thomas Raines, of Stirling, wrote to us that he knew of only one or two people that still had them; but national feeling has recently made commendable efforts to resuscitate a breed which certainly has commendable qualities, and with such result that it has found a place in the Standard.

As a rule Dumpies have a rather large, single comb, fair-sized wattles, and red earlobes. The real characteristics lie in a long and large and deep body, carried upon *extremely* short shanks, rarely exceeding $1\frac{1}{2}$ inches in length. In all the lighter colours the shanks are white; in blacks they may be dark. The plumage is found of all colours; and while single combs are most common, rose-combs are also allowed. These variations denote considerable mixture in breeding.

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* For the Rhode Island White *see* p. 506.

The Dumpy cock attains to 7 lbs. or 8 lbs. weight, the hen a pound less. The bird is a very good layer, and the flesh exceedingly tender and juicy, surpassing that of Dorkings in the opinion of some who have compared the two directly. They are admirable sitters, covering more eggs than their size would appear to warrant, and make good and assiduous mothers, who have the quality of generally taking readily to the chicks of other fowls. Taking it all in all, the fowl is one well worth more cultivation on both sides of the Border. The Standard will be found at the end of this chapter.

SCOTCH GREYS.

This is a most useful breed, which we have often wondered has not been more popular in England. It has long been known and valued in Scotland, but about thirty-five years ago seemed losing ground even there; more recently, however, it has been taken up with energy, and at many Scottish shows there are now large and good classes. It has been called the Scotch Dorking, but is entirely different in carriage and shape from that fowl, being more sprightly in form, with something of the Old English Game style about it. The comb is single and moderate in size, upright in the cock, usually falling over in the hen, the earlobe red, wattles medium in size, legs white or white mottled with black. The plumage in general resembles that of the barred Rock, but has a tendency to finer marking, and the more pronounced black and white of American Rock breeders. Compared with birds we saw at the Scottish shows in 1869-75, those of the present day have gained considerably in size, typical shape, and absence of white, black, or rust in the plumage. We do not remember at that time the "mouse-colour" mentioned below, which has probably been more apparent since the banishment of distinct white and black.

The Scotch Grey is a very moderate eater and good forager, and an especially hardy fowl, especially in cold or damp situations. The flesh is as a rule more juicy than that of the Dorking, partaking more of the Houdan character. The breed was not formerly known as a very good layer in comparison with some others; but it has been found that this quality, as in other breeds, can be easily developed, and good laying strains formed. We know it to be making progress both on the Continent and in the United States. The fowl does not appear, however, well adapted for confinement in sheds or very small runs, being too restless or active, and (like other breeds of that disposition) rather apt in such circumstances to start feather-eating.

The following article upon this valuable breed is kindly supplied by Mr. John Carswell, Falkirk, N.B., Secretary of the Scotch Grey Club:—

"The Scotch Grey, or 'Chick Marley,' as old Scotch country people used to call it, is one of our good all-round breeds of poultry. They are very good layers, and lay a fairly large egg of a pale cream colour. They are not good broody hens, sitting often ten or twelve days and then deserting the nest, and at a meeting of the Scotch Grey Club some years ago in Perth it was agreed, after some discussion, to class them as non-sitters. They are grand table fowls, being finely covered with flesh, of a very close texture and fine flavour, and pale cream in colour. They are also very prolific fowls, and you may cross them with any breed, and have a fine cross, showing distinctive traces in size, shape, or colour of the Scotch Grey parent.

"There has recently been a great demand from America, and even more so from Germany, for our good old breed, and a 'Scotch Grey Club' has been started in both countries, and is doing well. I have myself quite recently sent three lots of birds to German fanciers, who speak highly of the Scotch Grey as producing large eggs, and also of their very excellent qualities as a table fowl.

"When mating birds for breeding, one has to be very careful about the strains, or you may have a large percentage of both black and very light chickens. Strange to say, nearly all the blacks are pullets, and the very light-coloured ones are cocks.* Select a good shaped, fairly large, well and evenly marked cock, being sure that his colour is good and free from all rustiness in back and wings, and from mousey colour in body. Put him to hens equally well bred, evenly marked, and of specially good colour, with dark necks, and darker all over than the cock; such mating will produce the best birds, and give you more satisfaction than breeding from a dark cock and lighter coloured hens. A great evil, too, is breeding from either cocks or hens with white in tail, especially in sickle feathers. I never

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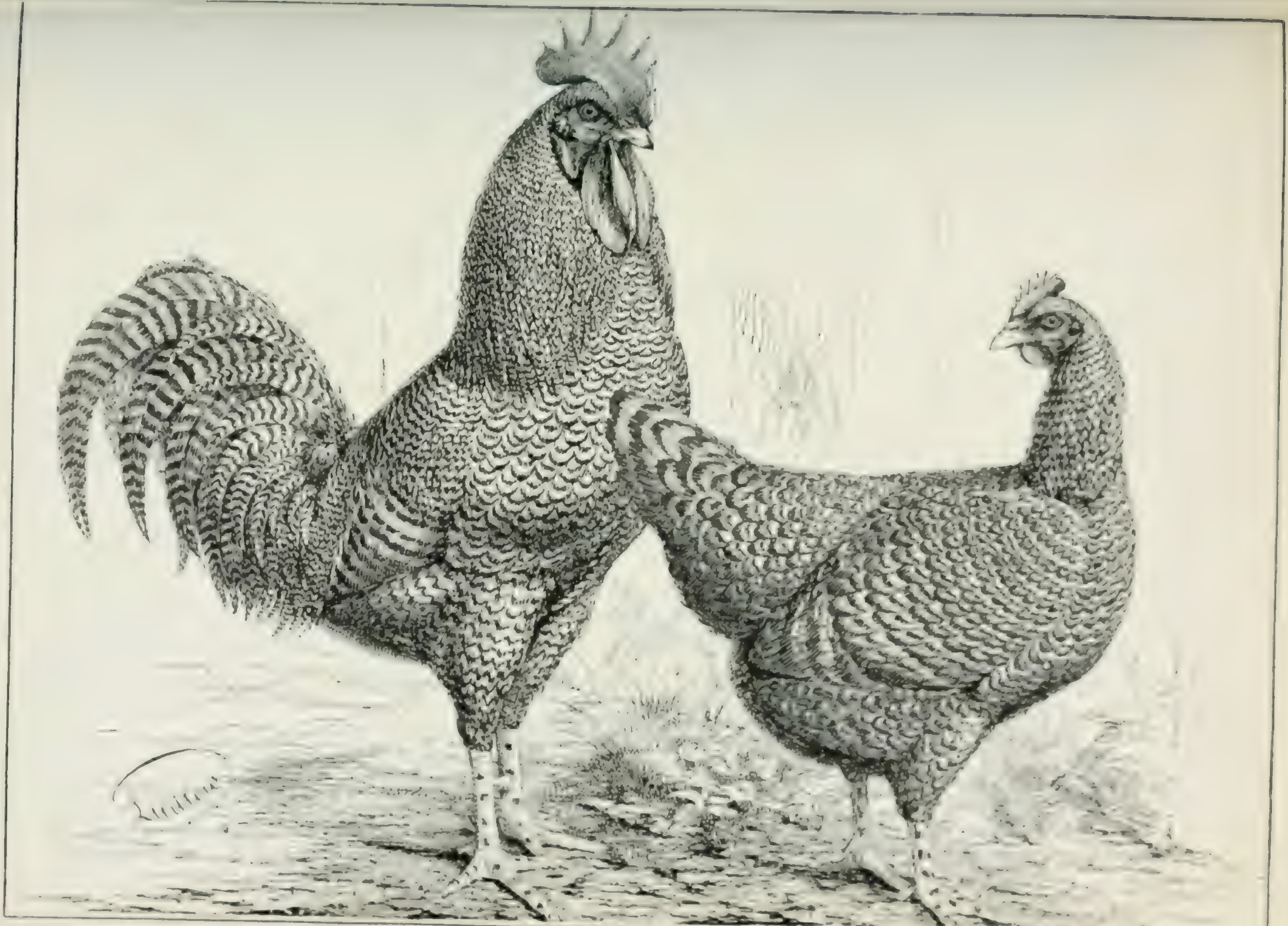
* It is the same in Barred Rocks.



SCOTCH GREYS.

would breed a cock with a lot of white in tail, though all his other qualities were nearly perfect; you simply can't get rid of white tails if you once get them. There are, of course, a lot more things to avoid, such as wry tail, squirrel tail, etc.; but as colour and marking are the two things most difficult to get, I deal more with them here.

"We have a very good Club in Scotland, first formed in December, 1885. It holds its annual show at different places throughout the country, where it offers good prizes. There has been great improvement worked in the Scotch Grey by the Club; small markings and pure colour, viz. hard black and clean white, being now the accepted standard. This is hard to breed, but still we are coming nearer the ideal. Cocks have still often a nasty brown on the saddle, and a mousey colour over the back and wings; but to have a good Scotch Grey we must get rid of all rustiness. I should prefer an opener marked bird, if clean in colour, than some of our small marked birds with the rusty backs; but some of our oldest breeders have still that strain, and it is hard to get them to come out of this evil, which quite spoils the general appearance. What we really want is only black and white; the black glossy and with a metallic lustre. The hens again ought to be fine and even in markings, clean colour and distinct, like shepherd tartan.

"The young birds grow up quickly, and thrive well in almost any climate, being extremely hardy. I favour high, dry, and rather cold soil for bringing up show birds, however, as the colour is always better, harder, and of a more glossy black and clean white."

The Standard will be found at the end of the chapter.

SILKIES.

These peculiar fowls are described by several of the oldest naturalists, "hair like cats" being one of the expressions employed regarding their plumage. Hence they must have been known from an early date; but it is remarkable that some later authors, such as Willoughby and Ray, write of these accounts as fanciful and unworthy of belief. The soft and flossy plumage is not the only distinguishing characteristic, however. The skin is of a deep violet colour, almost black, and the periosteum, or covering of the bones, is of the same colour: hence the fowl, though really excellent eating, is rather repellent to ordinary notions upon a dish. There is a moderate crest, standing well up, and in the cock rather backward. The comb, face, and wattles are of a deep mulberry colour; the ear-lobes should be a bright or turquoise blue, though often tending to the same purplish tinge; the legs also are of a deep bluish black. The strong dark blood obviously runs through the whole fowl. The legs are slightly feathered, and have five toes. The general shape, in some respects, resembles that of the Cochin, with ample cushion or saddle, and short tail, but without any of the latter breed's heaviness of carriage. The size has varied considerably: formerly cocks scaled 4 lbs. and hens 3 lbs.; but of recent years they seem to have become smaller, and the name itself is spelt "Silkie" by true believers.

The most obvious point is, of course, the peculiarity of plumage. In fowls generally the stem of the feather is strong, and from it proceed fibres which are stiff and elastic, and furnished with fibrils differently arranged on the forward and backward sides, so as to interlock and form the "vane" of the feather. In the Silkie fowl's plumage the stem is thin and weak, and the fibres weak and non-elastic, with rudimentary hair-like fibrils which have no holding power and no locking arrangement. The result is the loose and flossy character shown in Fig. 134, which is a body feather from a Silkie hen. Ordinary Cochin plumage is what one might almost call half-way towards this silky character; and it is not surprising, therefore, that the Silkie should present much

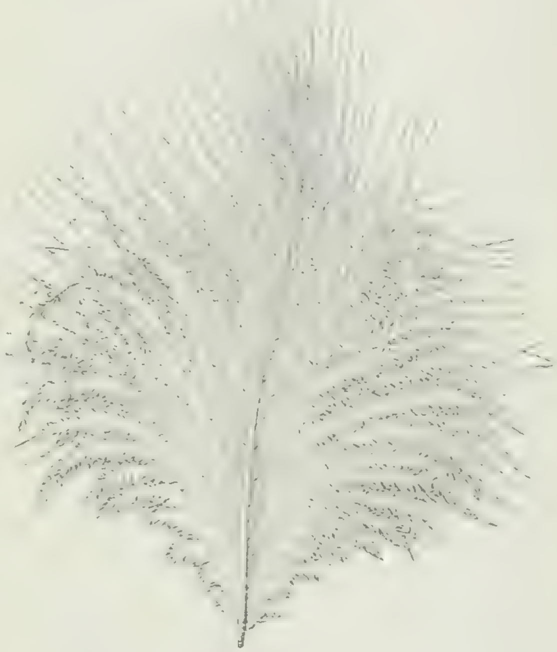
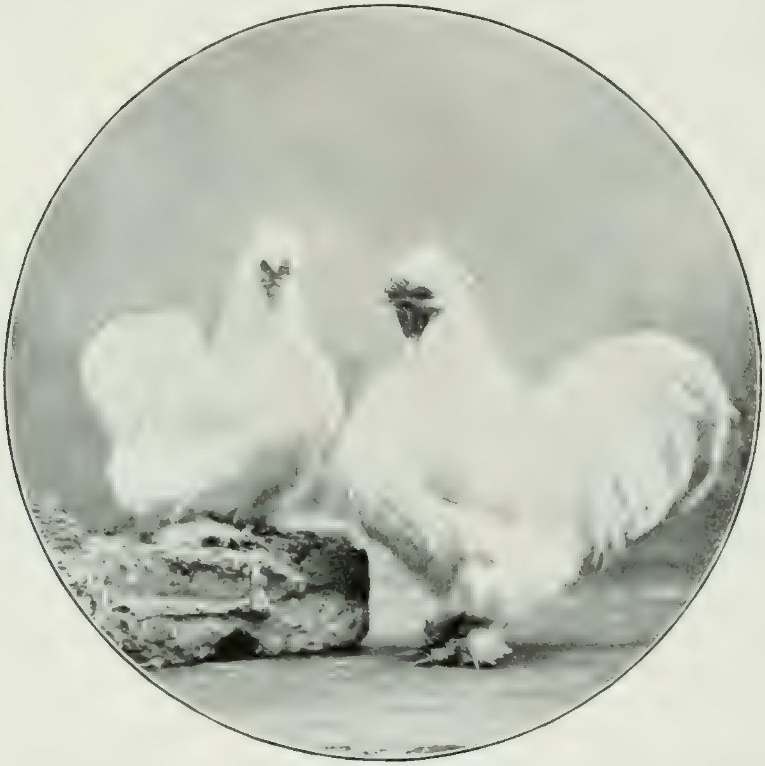


Fig. 134.—Feather from Silkie Hen.

Cochin type, and that the Emu Cochin should be the one breed which should sometimes present the silky type of plumage.

No one has probably known and bred Silkies so long as the Rev. R. S. Woodgate, of Pembury Hall, Kent, who in 1900 contributed the following notes, and who was a prominent exhibitor even before the first edition of the *Illustrated Book of Poultry* was published.



Silkie Hen and Cock.

(Exhibited by Mrs. Campbell, First and Challenge Cup, Crystal Palace, 1909. Photograph by Hardee, Chislehurst.)

"I cannot but remark how pleased I am to write these notes, as I did in the original edition long ago of Mr. Wright's *Illustrated Book of Poultry*. I have been acquainted with this most interesting breed for forty years. A Captain Finch brought home a pair about 1860, which, to my juvenile recollection, were as beautiful as any now on view. I have since endeavoured to find out where they came from, as the captain's widow still lives here (aged ninety-two), but could only glean that it was believed that China was their home. Again in 1869 I was introduced to a Miss Hawker, an old lady, whose garden was filled with Silkies, bad, good, and indifferent. She told me that an eminent officer in the Navy (her brother) had brought them home for her, but again she did not know where from: she thought Japan. I obtained some half a dozen birds from her, and with them made a strain which has held its own until the present day. With much trouble a great fancier of this variety has been trying to find if the Silkies are found in Japan. He sent photographs of birds to see if they could be traced, but no one seemed to know the variety. I have quite recently had here, however, a gentleman who had spent twenty-seven years in Japan, and who told me that he had seen there fowls similar to those in my runs; and upon his sending photographs which I gave him to another friend who had lived some years there, the latter wrote: 'I have seen the fowls you mention in Yokohama and neighbourhood, but do not recollect them at Kobe or Nagasaki.' It seems therefore probable that the popular name of 'Japanese Silkies' is fairly justified.

"It is surprising to notice the small difference that there is in the Silkie of thirty years ago and that of the present day. Perhaps the head-points are not now quite as good as they were then, for I remember them three decades ago as being most exquisite, with the turquoise lobes, the perfect crests, and small mulberry combs, with an indentation in them which, to my mind, the male bird certainly should possess; but the present-day birds are rather shorter in the legs and have more silk on the wings, which I look upon as a great improvement so far as it goes. We must not, however, forget that Silkies should have tails. I am afraid that many are now sliding into a pure Cochin or Pekin Bantam-shaped bird. This should not be. The tips of the tail feathers, as silky as possible, should protrude beyond as dense a mass of silk as is possible. The colour in cocks I do not think on the whole has improved. I know, naturally, how all white birds go to yellow, more or less in the summer, but there does not seem the purity all round that there was some years ago. It is hardly necessary to say that Silkies should be exhibited as white as possible, and this is not a difficult breed to produce pure-coloured stock when the birds are properly mated. But beware of the drip from trees. So many put their birds in an enclosed run round an oak or a beech, or so on. Whether winter or summer, the rain brings something from the leaves or bare boughs which discolours the birds. I have noticed the same with Sultans enclosed under forest trees; so now, and oddly enough, my dark-coloured birds have very leafy roosts, and the white ones the sunshine, with temporary shelter, when enclosed, of sacks or shutters.

"Some express difficulty in obtaining the beautiful blue ear-lobe and the deep-coloured mulberry comb in small birds. I have found the same. Nevertheless, it can be done, as my own experience knows. I grant that the coarser birds come with charming head-points and generally with excellent feet, while the feet and beaks are both blue, but the birds are too big. We have, therefore, to cross these birds with the smallest hens that we can find, and then, discarding all but the true in ear and comb, cross again once more these with the grand-parent or his brother. I have thus obtained a regular strain of beautifully headed birds. Some specimens have been winning during the past season with either lead-coloured ears or ears of no colour at all. I think that the points of the head should be most certainly taken into consideration as well as the silk.

"The next question is that of green beaks and legs. The former are not so aggressive if they are only slightly tinged; yet they should be as blue as the beak of a cock Budgerigar. I have known a greenish beak in time grow blue; in fact, quite frequently so. But I have never known a green leg turn blue, not even a greenish one. Green legs show decidedly some *mésalliance* between strains. Green-legged birds I always recommend to be killed in their babyhood: it saves trouble, expense, and the dawn of hope which never comes to fruition.

"These attractive fowls are good layers of small, cream-coloured [or white—Ed.] eggs all the year round. The hens will lay with cackling delight through the deepest snowstorm, and seem as hard as bricks. They are very bright and contented, and a trio or two on a lawn, when they can have a small roosting-house in a neighbouring shrubbery, are not only most beautiful and attractive, but they decidedly pay their way. The pullets lay early, and continue to do so until they have laid some number of eggs, but the hens will only lay from seven to ten eggs before desiring to sit upon them.

"It is unfortunate that so many Silkie chickens turn out to be cockerels. I am told the same story all round in regard to this. And sometimes it is a difficulty to keep the legs of this variety clean; they so often suffer from the insect disease known as elephantiasis. This can easily be warded off by a rubbing on the feet and legs of some compound sulphur ointment once a fortnight."

Mrs. Campbell, of Uley, Gloucestershire, very kindly contributes the following notes on the Silkie, and the improvements in the breed during the ten years prior to 1911:—

"There is no doubt that careful mating and breeding, and the extended classification and competition in shows of recent years, has much improved type and quality of plumage in these birds. It is now quite the usual thing to see Silkie cocks with ragged wings and tails without hard feathers or sickles, whereas it used tc be the exception. The hens, too, have much improved in wing—the hen I won the cup at the Palace nine years ago would not have a chance in the show pen to-day—and cocks also used to be of a much coarser type, hard feathers not only in wings and tail, but also in the legs and feet. It is not my experience that the hens or pullets lay so few eggs before getting broody; I generally have from twenty to twenty-four eggs at least before they sit. Also, my strain has always laid a white egg, not tinted, as other breeders state.

"As the Silkie is not a Bantam, I am greatly averse to reduction in weight of these birds; if quality and size can be kept, the better it will be. In my own strain I notice that small specimens show also other signs of degeneration, and if such be chosen to breed from, this degeneration must increase. Many are considerably lighter in weight than the approximate weights suggested in the Silkie Club Standard, though looking large when they carry a great amount of silk. I have had hens with the "silk" three inches long; this, standing out, increases the apparent size.

"There is no doubt that the purity of colour has greatly improved. A canary-coloured cock won at the Dairy some few years ago; such would not have a chance now. As to other colours, the blacks are the only ones shown with any attempt at purity of colour and silkiness. I have a very fair pen of blacks now, but the difficulty is still with the male birds' hackle. In France there is quite a number of coloured varieties. 'Rosy-skinned' seem to be the most esteemed, but up to date we have not seen such birds in England, and there seems to be no inquiry for such here. In breeding for blacks I have obtained from time to time a considerable number of partridge-coloured pullets perfectly silky in plumage, markings blurred, of course, but very attractive; but there has never been a male bird of this cross hatched! I call them 'Brownies.' They are very useful as sitters and mothers, and may in time form a coloured species, similar to one of the French varieties now exhibited on the Continent.

"I do not find a disproportion in the number of each sex hatched such as Mr. Woodgate describes. As to the natural habitat of the Silkie, Dr. Campbell has made search in Japan for Silkies, and has come to the conclusion that these birds were imported from South-Eastern Asia, and are not strictly Japanese."

Besides the usual white Silkies mentioned above, we have seen on several occasions specimens quite black, and of most singular beauty they were. Crosses between the Silkie and other breeds usually lose the peculiar plumage, but the black skin and bone persist for generations. Such crosses have found mention by some older writers as "Negro fowls," but have no merit. Cross-bred birds often possess, however, the sitting propensities and qualities of the Silkie parent.

This strong incubating instinct of the Silkie makes it a most valuable fowl for those persons who need sitters to hatch pheasant or Bantam eggs. We cannot say that the general reports we receive quite bear out Mr. Woodgate's remarks about the laying of the pullets: most of our friends state that even these rarely lay more than fourteen or fifteen eggs, and many less, before desiring to incubate; though they are easily dissuaded if necessary, and soon lay again. As they lay early and with certainty if hatched in time, and incubation can be hastened if desired by leaving eggs in the nest, Silkies and their crosses may be a most valuable portion of the poultry plant, being splendid mothers for small birds, and going rather long with their charges. The one objection to them in this respect is the really extraordinary tendency of the breed to scaly leg, which will in turn be transmitted to the chickens if an affected bird be employed as a mother. The remedy is, of course, to watch and guard against the complaint from the first, though we think an occasional greasing with oil containing some kerosene better as a mere precaution than the sulphur ointment mentioned above. When Silkies are kept for this purpose, the larger specimens should be bred from, being much more useful.

White Silkies require care in washing for exhibition, else a bird well feathered in shanks as it entered the bath may be found nearly denuded when finished. The legs should not be washed in hot water, but only lukewarm at most. The water for the rest must only be comfortably warm; and if the bird faints, as it is rather apt to do if too hot water is used, it should be plunged at once into a tub of cold kept handy. In any case this should never be omitted at the end. This treatment will tend to prevent the shank-feathering coming out.

The Standard of Poultry Clubs is given at the end of the chapter.

SULTANS.

These birds belong to the great Polish family. Those now bred are from fowls sent to Miss E. Watts from Constantinople in 1854; but very similar birds appear to be mentioned in several old writers, and to be known in South Russia. Only one or two specimens have been imported since Miss Watts' originals, and breeders have never been numerous. Yet it is a pretty fowl, with very pretty ways and habits, and a disposition to accept and return petting, and a mixture of tameness and sprightliness, which are very attractive.

The crest of the Sultan is full and globular, the comb two tiny horns, beard and whiskers very full, and wattles scarcely visible. So far they are simply smallish white Polish fowls; but have five toes on each foot, the shanks being well feathered, and the thighs heavily hocked. The plumage is entirely white.

The following notes on the characteristics of Sultans are by the Rev. R. S. S. Woodgate, of Pembury Hall, Kent:—

"Although I have but of recent date taken to keep this beautiful variety, still I have followed the breed for some thirty years with keen interest. It is a very charming fowl, with an immense deal of character. I have found them impatient if disturbed—in fact, they will fly out of their homes like birds, and alight on any adjacent tree or wall, only in two or three minutes to fly down again, and to be as domesticated as is possible. They do well in confinement, and are layers of large white eggs, and these in goodly numbers. It would hardly be credited how large is the size of the egg from even a pullet of this variety, considering its size. The eggs also appear to be peculiarly fertile; anyhow, this has been my experience. I have found the Sultans to be most hardy, almost equalling the Silkie in this respect, while the chickens soon fledge and wander about over the dew-coloured grass with pleasure and impunity.

"It appears to me a pity that this pleasing variety should not have more admirers, for the habits of the birds, whether in confinement or otherwise, are interesting in the extreme. I think, however, whether from in-breeding or otherwise, that the Sultan is hardly as massive or shapely as it was some twenty-five years ago. Anyhow, it will be a sad pity for the breed to be allowed to pass away, and a class or two at our big shows, at least, ought to show us what we still have in specimens of this beautiful and at the same time useful variety."

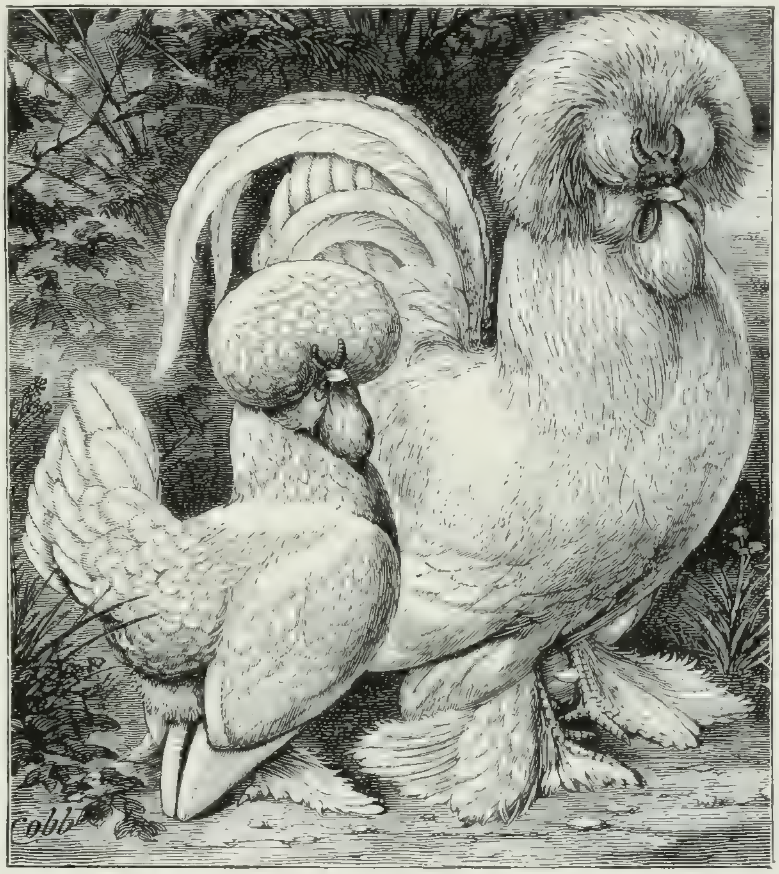
The spurs of the cocks of this breed are especially apt to grow very long as the bird gets old, curling upwards so that the point enters the leg if left alone. Now and then we have seen a white Cochin cock in the same condition, but not so often as in the Sultans. When this occurs the spur should be partially sawn off and the point rounded.

Fowls resembling Sultans in being all white, crested, muffed and bearded, feather-legged and vulture-hocked, but differing in being distinctly high on the leg, were exhibited many years ago under the name of Ptarmigans, but have long been extinct. They were probably descendants of some former importation, the effect of long in-breeding in producing weediness of build being well known.

Sultans have been given a Standard, which will be found at the close of the present chapter.

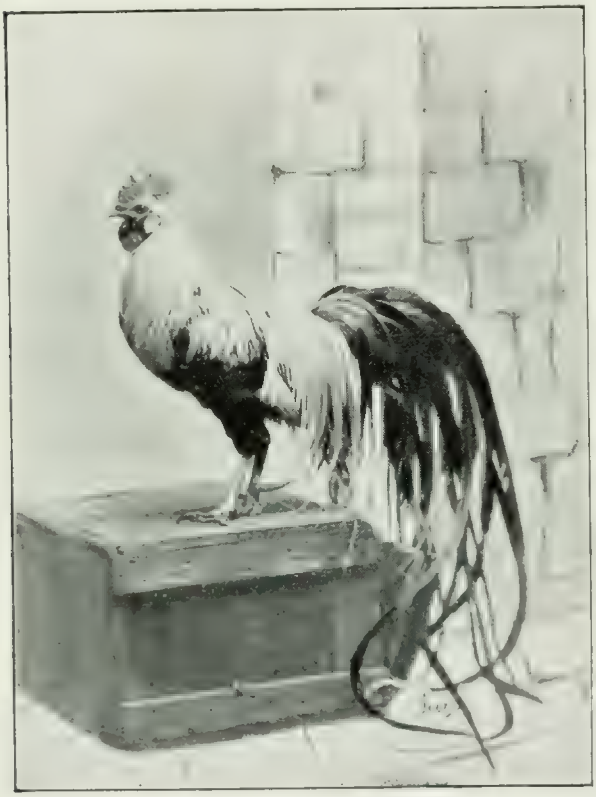
YOKOHAMAS.

About the year 1878 there appeared in Germany, and a year or two later in England, fowls imported from Japan, whose principal peculiarity consisted in length of tail and immense development of the cock's sickles and saddle feathers. Some were exhibited as Yokohamas, others as "Phœnix" fowls; but careful comparison of the representations published, and of photographs and drawings which reached us direct from the Continent, failed to show any distinction beyond greater or less development of the peculiar plumage. The long plumage was, however, unique, and a fair idea of it may be gathered from our illustrations. In a drawing of a pair of German birds in our last edition one of the cock's feet has five claws, a proof of the crossing which had undoubtedly taken place.



Sultans.

Correspondence brought out the fact that such birds had been occasionally exhibited as "Japanese Game" so far back as about 1872. It further appeared that in the Japanese Great National Museum at Tokio there were preserved two specimens of the race, in which the sickle-feathers measure 13½ feet and 17 feet respectively! and a feather has been actually sent to France which measured 2 metres 85 centimetres in length. In 1884, Mr. Gerald Waller, of Twywell, imported a pen of these still more extraordinary birds; and from his statements it appears that they are known in Japan as Shinowaratao, Shirifuzi, or Sakawatao fowls, and by other various names. The very long-tailed ones are kept in high, narrow cages, always sitting on a perch covered with straw rope, with no room to turn or get down, but with a food and water tin at each end of the perch. Three times daily they are lifted down for a few minutes' exercise, their tails being carefully rolled up and enclosed in paper cases to keep them from injury. The Japanese state that a tail has been measured 23 feet in length, and that the birds only moult the tail once in three years. This last fact is highly interesting. It is obvious that if a tail 23 feet long were grown in one year, it must be at the rate of nearly three-quarters of an inch per day; and though Madame Bodinus states that she *could* "see the tails grow daily," it is difficult to realise this.



Duckwing Yokohama Cock "Mikado."
The property of Mrs. S. R. Masters. First and Medal, Crystal Palace, 1910.

Tails exceeding 6 feet in length have, however, never reached Europe, the saddle-hackles of Mr. Waller's birds having been about 16 inches; and in Japan itself tails over 6 feet are exceedingly rare. But the stock has had to be further crossed to prevent extinction. Nearly all that on the Continent was indubitably crossed with English Game, and from this the present known stock has been derived. By this somewhat has been lost in mere length of feather, but much has been gained in hardiness and real beauty.

Many names have been proposed. The Germans were mainly answerable for "Phœnix," which has no meaning; and "Japanese Long-tails" was too general. Some attempt was made to get Shinowaratao recognised, but to the appellation of "Yokohamas" the breed has now fairly settled down. We are indebted for the following notes upon it to Mr. Frank E. Rice, of Sudbury, Suffolk, who has kept and bred it for some years:—

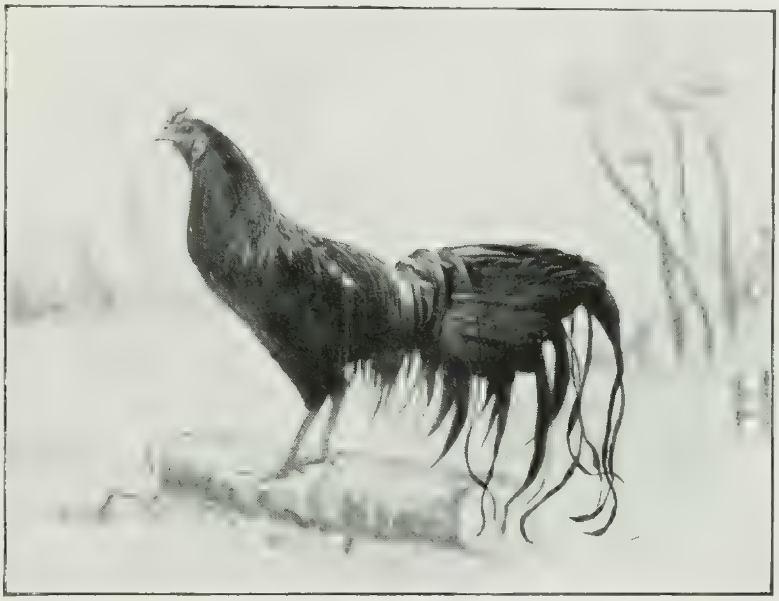
"To speak or write adequately on the beauty of Yokohamas (sometimes called Long-tailed Phœnix or Japanese Long-tails) is beyond the power of tongue or pen. They rank above all other breeds of poultry in their highly graceful character, and the beautiful formation of the tail, which is their special characteristic. The long sickle-feathers grow about 2 feet the first year, and each moult they come out longer, till the tails reach 5 feet and sometimes 6 feet in length. It is not altogether the length, but also the sprightly way in which they carry their tails: not in a drooping, dangling fashion, but in a most graceful curve from the formation which carries the weight, which adds perfect symmetry to an evenly balanced tail.

"The feathers should be broad and strong, except the hangers, which are soft and flowing, the saddle feathers hanging to the ground in great abundance. The wings, which are very long, are carried close up. The head should be neat and small, with evenly set pea comb, and the neck should have a great abundance of hackle feathers. Legs are medium length, of a bluish willow colour, and should have only four toes. In all respects the Yokohama should be a long-made bird, with long neck, long body, and long tail.

"There are several colours; those best known are the Duckwing colour and pure white, the former being the most attractive. At present all are exceedingly rare. The sickle feathers are used as plumes in officers' helmets and ladies' headgear, as in the former coloured birds they are of a most beautiful lustrous black.

"Notwithstanding their beauty, Yokohamas are very hardy and easy to rear. Chickens should be hatched in March, April, May, and June, to grow to maturity, as I have found very late hatched birds never grow much tail, which is such an important feature in the fowl. As layers it would be hard to beat them: wet or dry, snow or wind, they continue quite unconcerned. Their eggs are very rich, and although small, contain the same amount of nutriment as a full-sized one. The birds themselves are a dainty dish. Being exceedingly active, their eggs are wonderfully fertile. I very rarely have a clear egg, and find chickens hatch out very strong."

The birds that we have most admired have not been those with most length of sickle. Of this five to six feet can be got, as above described, but specimens of less age, and not exceeding three feet, have more impressed us. A young pair of birds appeared at the Crystal Palace show of 1900, of which the cockerel scarcely reached that, but for pure and simple *beauty* in fowls we never saw anything to surpass them. Long as the male's plumes were, he had actually reached the inside of an exhibition pen with every sickle and hanger absolutely smooth, sound, and unbroken! The sound smoothness of every feather seen in this case should, we think, be taken more account of than any mere length of feather which cannot be kept in order; but so long as such condition can be maintained, doubtless the longer the better. To attain it, good range and "hard" feeding are obvious means; also mature age, hatching in good time, and an occasional pinch of sulphur in the food.



Black-red Yokohama Cockerel.
(Bred and Exhibited by Mr. E. H. Turrell. First Crystal Palace. 1910.)

Since these notes were written for our last edition a specialist club has been founded for the Yokohama, and as a result classes have been given for the breed at many leading shows, with gratifying results in entries. Writing in *The Feathered World* Year Book for 1911, Mr. E. H. Turrell, of Ide, Sevenoaks, thus speaks of the Yokohama:—

"Of the many fine breeds notable for their excellence, yet in danger of being overlooked for some newer product of the breeder's skill, none, perhaps, is more deserving than the Yokohama.

"Having many points of excellence in common, the entire Yokohama family have established a very good reputation for their laying qualities. Although not a very large egg, the quality is generally acknowledged to be the very best for invalids. I claim attention also for the other merits of this exceedingly handsome, useful, and valuable fowl.

"In the first place, contrary to a popular impression, the Yokohama is very hardy and vigorous from the start. The chicks are active and lively as soon as they hatch, and are not nearly so likely, as are the heavier birds, to meet with accidents at the outset. The chicks feather out early, and are thus enabled to withstand cold or rain much better than the heavier breeds that are slow in feathering. Furthermore, Yokohamas make most excellent mothers; they are light, and therefore do not break nearly so many eggs in the nest as do the heavier fowls. They will hunt and scratch for their young in a most industrious way, and, if need be, will fight for them, almost like a Game hen.

"Again, the Yokohama has the reputation of being wild and nervous. Let me say that this depends very largely upon the treatment. In keeping them in small flocks, particularly if one is gentle and careful, they may be made almost as tame and tractable as fowls of the larger breeds. I have no difficulty whatever in training them to be lifted from the nest at pleasure.

"The Yokohama is a great ranger, and this, together with her excellent laying qualities, makes her a very useful fowl to have on a farm. After repeated trials, I am convinced that for the average man there is much better profit in eggs than in chickens. On many a farm a flock of Yokohamas would pick up half their living, during a considerable portion of the year, from what would otherwise be wasted, and if given half a chance, they will produce a great number of eggs in the winter months, especially the Blue or Black-reds."

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Small, but inclined to be long and tapering. *Beak :* Strong and curved. *Eyes :* Bright and full. *Comb :* Single or pea, small and even. *Face :* Of fine texture. *Ear-lobes :* Small, oval or almond shape, and fitting closely. *Wattles :* Round and small, in keeping with the comb and ear-lobes.

Neck.—Long, and furnished with long, flowing hackle.

Body.—*Breast :* Full and round. *Back :* Long and tapering towards the tail. *Wings :* Long, and carried rather low but close to the sides.

Tail.—As long and flowing as possible, with a great abundance of side hangers, the sickle and coverts narrow and hard, and the whole tail forming a graceful curve and carried somewhat low.

Legs and Feet.—*Legs :* Of medium length, and the shanks fine. *Toes :* Four on each foot.

Carriage.—Stylish and pheasant-like.

Weight.—4½ lb.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences. (NOTE.—To emphasise two of the chief points of the breed it may be said that the hen's back must be long and tapering to the tail and furnished with long saddle-hackles, and that the tail must be very long and carried horizontally, the two top feathers gracefully curved, and the coverts sickle-like.)

Weight.—2½ lb.

COLOUR

THE DUCKWINGS (GOLD AND SILVER)

The colour of these two varieties is the same as in typical Modern Game fowls of those colours, but all black feathers must have a beetle-green sheen.

THE SPANGLED

Beak : Horn. *Eyes :* Ruby red. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Slate or willow.

Plumage of the Cock.—Black and white. *Neck-hackle :* White, each feather at its base having a narrow black stripe down the centre. *Breast, Thighs, and Fluff :* Black, each feather being tipped with a crescent of white. *Back :* White. *Saddle-hackle :* White next to the wing, then slightly striped with black, the stripes gradually becoming heavy as they near the tail. *Wings :* Bow, white ; bar, black, with a white lacing ; secondaries, white, and black on the inner web, which is seen only when the wings are opened. *Tail :* Black, the lower coverts having a distinct white lacing.

Plumage of the Hen.—*Hackle :* White striped with black. *Breast and Thighs :* White. *Back :* White, slightly pencilled or laced with black. *Tail :* Black, coverts evenly laced all round with white.

THE WHITE

Beak : White or yellow. *Eyes, Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* White or yellow.

Plumage.—Pure snow white, free from any straw tinge.

OTHER VARIETIES

NOTE.—The foregoing are the principal varieties, and others are not sufficiently numerous to warrant description. The above colours and markings are ideal, but in Yokohamas not so much value is attached to these points as to general type and the quality and length of tail and hackles.

SCALE OF POINTS

Type and condition	25
Tail : quality and length	25
Hackles : quality and length	20
Colour	10
Head	10
Size	5
Legs and feet	5
	100

Serious defects : More or less than four toes on each foot ; wry tail ; humped back ; crooked breast.

Lakenvelders.

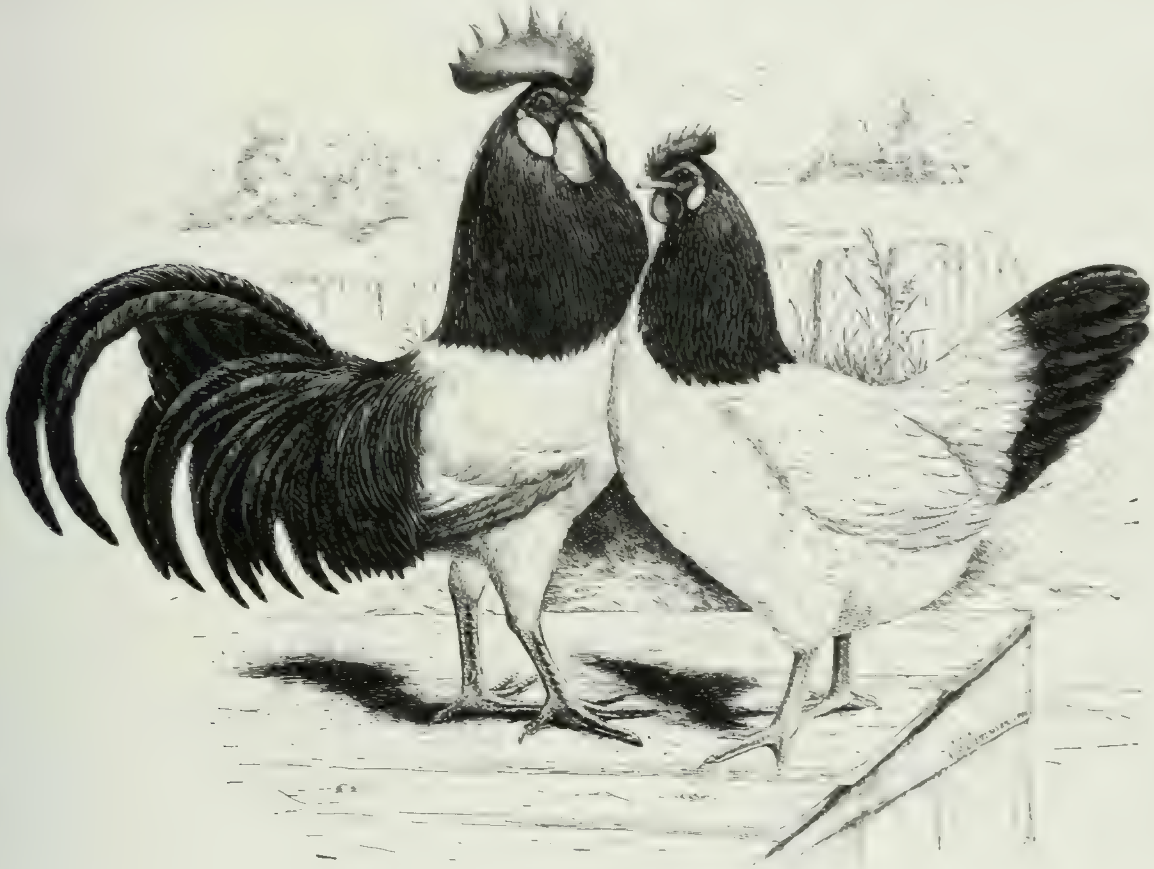
The Lakenvelder fowl has only been known in England since 1901, but appears to be of considerable antiquity in both Holland and northern Germany. There was a curious legend that it hailed from Jerusalem, but the best informed German fanciers have never doubted that the breed originated in the same stock as the Campine or Braekel. There has been some discussion whether the name should be spelt as above, or Lakenfelder, which is the German spelling. The pronunciation should be the same in either case, as *f*, and the *v* may lead to some mistake ; but on the other hand it is to be noted that English stock was imported from Holland, and English fanciers have adopted the Dutch standard of a black saddle in the cocks, whereas the Germans prefer white or striped ; hence the Dutch spelling helps to keep the true standard definite and clear.

While at a first glance the Lakenvelder gives one the idea of Leghorn type, closer scrutiny soon makes it clear that it truly belongs to the Brackel or Hamburgh family. Its smaller size, its dark legs, and its carriage resemble that class of fowl; and its small eggs and unsuitableness for close confinement show the same relationship.

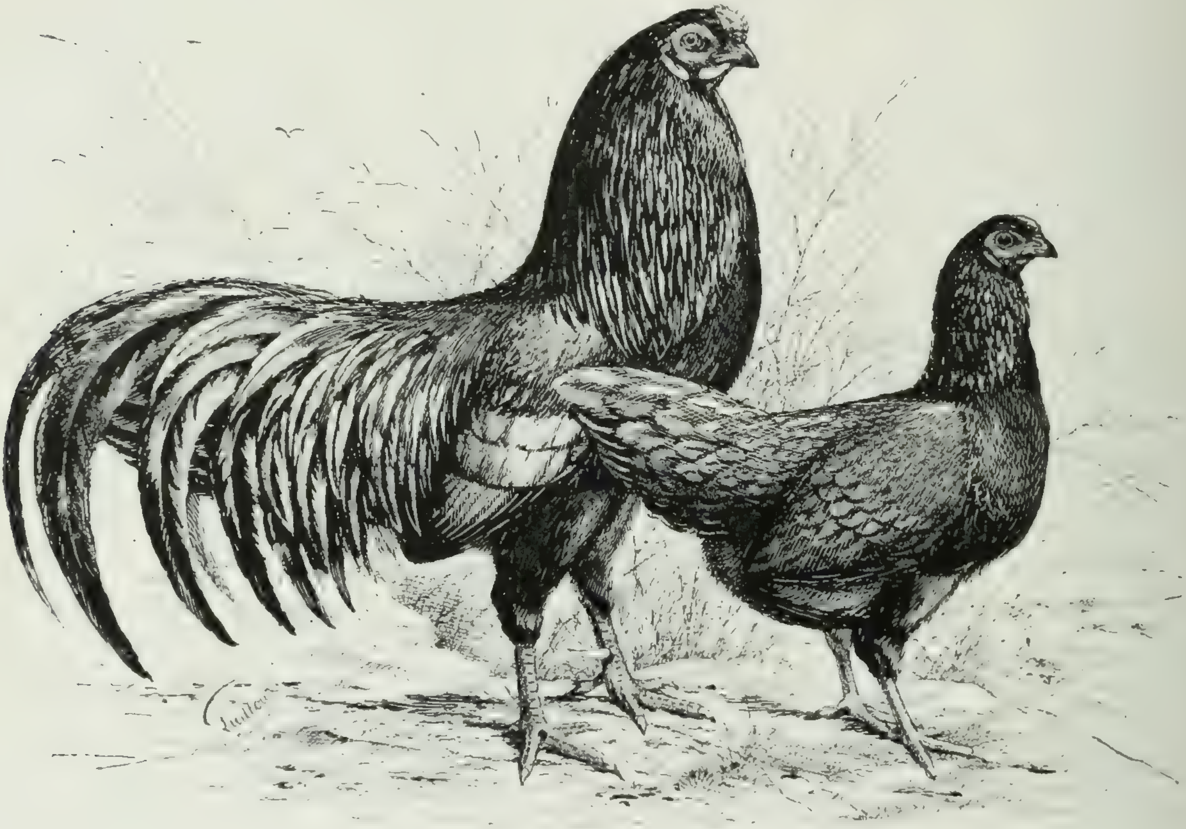
Mr. Percy W. Thorniley, one of the earliest breeders of these birds in England, kindly sends us the following notes:—

"Since Lakenvelders made their appearance in England in 1901, being exhibited for the first time at Shrewsbury Show in June of 1902, there has been a marked improvement of the breed; and all fanciers visiting the Dutch and Belgian shows state that we have better exhibition birds in England than any shown abroad. The reason for this is not hard to find. The Lakenvelder Club may not be a very strong society, but it has done one good thing by issuing a standard, and the members all striving to breed up to it.

"Lakenvelders are by no means a new variety, for they can be traced back to the first half of last century in Germany. Most of the birds imported, however, came from Holland, and we in this country follow the Dutch standard of a black saddle hackle in the cocks, whereas the Germans favoured a white hackle, but a striped or ticked hackle not disqualifying. The hens when first imported were white, with grey necks and tails, and little else can be said for them, as I have not found any reliable Continental standard for the females, and so hens for the first year or so in this country won simply through the pureness of the white. Now we strive for a neck-hackle as dense black as possible, and a solid black tail, with the rest of the plumage a pure white. A hen of this type is really a pretty bird. Not one hen in fifty that came over, however, possessed a black tail, and consequently it is really harder to find a good hen than a good cock.


Lakenvelders.

"The main points to breed for in the cocks are a black neck-hackle, with no grey feathers about the head; a black saddle-hackle, and a good black tail, nicely carried, with the rest of the plumage a pure white. The under-colour is more or less grey in both sexes.



Black Sumatras.

"The mating of Lakenvelders to produce birds to the standard from one pen is, of course, more or less uncertain work, and if we had more good birds to choose from, perhaps not to be recommended; but it can be done, as the challenge cup cockerel and the first prize pullet at the International Show of 1904 were both produced from one mating. As there is such a difficulty in procuring good hens, it is not a bad plan to run first a good exhibition cock, and then change him for a cock much lighter in saddle, trusting to get from the last mating a better body colour in the pullets. But do not breed from those nice white hens that have absolutely nothing else to recommend them.

"I think it will have to be admitted that Lakenvelders are not going to oust some of our older-established breeds as regards winter layers, but they certainly can retain their position as a fancy variety. Even as layers, though not laying much before February comes in, they do very well to keep with some of the heavier breeds; for when these latter begin to go broody the Lakenvelders take their place in egg production, and lay right on to the moult."

When really good, with jet-black hackles and tail on a clear white body, the colour of Lakenvelders is very attractive; but they are exceedingly difficult to breed. The best guide will be found in a proper balance of tone in the grey under-colour. An occasional speck on the body is better than washy grey hackles.

The Lakenvelder requires a good range to thrive well, and the wider the better. In such circumstances it is fairly hardy; but it can hardly be termed so otherwise, and the chickens also require care. The wider it can forage, the hardier and more profitable it is found to be.

The Standard is as follows:—

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Short and fine. *Beak :* Strong and well curved. *Eyes :* Large and bright. *Comb :* Single, of moderate size, erect, following the contour of the skull, and evenly serrated. *Face :* Of fine texture, and smooth. *Ear-lobes :* Almond shape. *Wattles :* Medium length, well rounded at base.

Neck.—Of medium length, finely tapered, and furnished with long hackle flowing well on to the shoulders.

Body.—Long, and tapering to the tail. *Breast :* Broad and full, and carried upward. *Back :* Broad and short. *Wings :* Of medium length, carried well up, the bows and tips covered by the neck-hackle and saddle feathers.

Tail.—Full, the sickle feathers long and carried at an angle of 45 degrees.

Legs and Feet.—*Legs :* Of medium length, the shanks free from feathers. *Toes :* Four on each foot, strong, and well spread.

Carriage.—Sprightly.

Weight.—6 lb.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences. (NOTE.—The comb is carried erect, and not drooping.)

Weight.—4½ lb.

COLOUR

Beak : Dark horn. *Eyes :* Red or bright chestnut. *Comb, Face, and Wattles :* Bright red. *Ear-lobes :* White. *Legs and Feet :* Blue slate.

Plumage.—Black and white. *Hackle* (and in the cock the saddle hackle) *and Tail :* Solid black, free from stripes or spots. *Remainder of Plumage :* Pure white.

SCALE OF POINTS

Colour	45
Size	20
Head	10
Type	10
Condition	10
Legs and feet	5
	100

Serious defects : Comb other than single ; feathers on shanks ; wry tails ; any other deformity.

Sumatras.

In the first edition of this work brief reference was made to this breed, as still kept and valued for its exceeding beauty in the United States, and possibly worth introducing to this country. As already indicated (p. 340), we have seen similar birds between the years 1870 and 1877 under the name of Pheasant Malays, and believe them to have been at that time used for crossing with the Cornish Indian Game; but they appear then to have quite disappeared, and not to have been known since, until Mr. Frederic R. Eaton, of Cleveland House, Eaton, Norwich, imported in 1902 some specimens which had won at the 1901 Pan American Exposition, and another pen the following year. From these importations the stock has already spread considerably, and a Club has been formed to promote the interests of the breed. Mr. Eaton, formerly honorary secretary of the Club, has kindly furnished the following notes, the accompanying illustration being also drawn from some of his birds:—

"The earliest mention of the breed that I have been able to find is in *Miner's Domestic Poultry Book*, published in America in the year 1853. They are described by Miner as of indomitable perseverance and courage, and noted for a beautiful green metallic lustre upon their plumage. He further gives notes by Dr. John C. Bennett, who stated that a trio of birds (probably the first specimens) were imported to Boston direct from Angers Point, Sumatra, in April, 1847, by Mr. J. A. C. Butters. Dr. Bennett describes the birds then as having a small head, powerful beak, eyes lustrous, quick, and fiery, a pea-comb (though single combs sometimes appeared), small wattles with a very small dew-lap, hackles long and brilliant, tail long and drooping or horizontal (in the case of the cock with abundant 'plume'-feathers sweeping the ground; fan-shaped in the case of the hen), body slim and very symmetrical, legs sinewy, with a powerful and muscular thigh; colour of plumage variable, though he himself preferred black. The fowl was not known in England at this date.

"As to breeding, Black Sumatras are not of large size, but it would appear that the birds do not now equal in size those of years ago. This, however, can no doubt soon be remedied by care and selection, but we must be careful not to obtain size at the expense of type. Both male and females in the breeding pen should, as far as possible, be perfect in this respect. The cock should have very long and flowing tail and hackles, while if the tail feathers of the hens are very long and nicely curved, all the better. With regard to the head-points of most cocks there is room for great improvement, and care should be taken that not only does each of the hens have a strong beak, red eyes, neat comb and gipsy face, but that the cock has these points as far as possible also, though up to the present I have never seen a cock with the true gipsy face, and have been informed that this has not yet been obtained even in America.

"The colour of the plumage being a rich beetle green, as in Black Hamburghs (though in the case of Sumatras the sheen is very much greater), the notes on breeding for colour contained in the chapter on Hamburghs will apply, and need not be here repeated.

"I have found that the variety breeds wonderfully true, the proportion of 'wasters' being very small, while the cocks and hens being so alike in characteristics, exhibition males and females can easily be bred from the same pen. Up to the present time all the birds I have bred have had the pea-comb, except three or four chickens bred from a pen headed by a cock having a specially small comb. The serrations to these single combs were not like those seen upon an ordinary single comb, but quite small, and very similar to the serrations upon the comb of Sonnerat's Jungle Fowl.

"The chicks are hardy and easy to rear, and, provided the stock birds are in good condition and not overfed, the percentage of unfertile eggs is small. The hens have proved themselves very good layers of white-shelled eggs, though the eggs are not large, but by selection the size could no doubt be increased. They are also excellent sitters and mothers, decidedly beyond the average, and, being careful and light in their movements, are particularly valuable for hatching Bantam eggs.

"Although not large, the breed is useful as a table fowl, being plump, and the meat juicy and of a delicious flavour."

Regarding the question of type mentioned above, some tendency is already perceptible in certain quarters to seek approach to the type of the Aseel, as regards especially a more upstanding or sloping carriage, and the broader eyebrow. It is much to be hoped this may be resisted. The head should be fine and the back horizontal, and to lose these points is to lose real characteristics of the breed. The Standard is as follows:—

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Small, rather short, and somewhat rounded. *Beak :* Strong, of medium length, and slightly curved. *Eyes :* Large and very bright, with a quick and fearless expression. *Comb :* Pea, low in front, fitting closely to the head, the smaller the better. *Face :* Smooth and of fine texture. *Ear-lobes and Wattles :* As small as possible, and fitting very closely.

Neck.—Rather long, and covered with very long and flowing hackle.

Body.—*Breast :* Broad, full, and rounded, with straight breast-bone. *Back :* Of medium length, broad at the shoulders, and very slightly tapering to tail ; saddle hackle very long and flowing. *Stern :* Narrower than shoulders, but firm and compact. *Wings :* Strong, long, and large, carried with the fronts slightly raised, the feathers folded very closely together, not carried drooping nor over the back.

Tail.—Long and drooping, with a large quantity of sickles and coverts, rising slightly above the stern and falling streaming behind, nearly to the ground, and the sickle and covert feathers not too broad.

Legs and Feet.—*Legs :* Of strictly medium length, strong, and set well apart, the thighs thick and muscular, the shanks straight and covered with smooth, even scales, not flat nor thin. *Toes :* Four on each foot, long and straight, well spread, the back toe standing well out and flat on the ground, and the nails strong. (NOTE.—There is no objection to two or more spurs on each shank, it being a peculiarity of the breed for this to occur.)

Carriage.—Pheasant-like, straight and upright in front, and with a proud and stately action.

Weight.—5 lb. to 6 lb.

Plumage.—Very full and flowing, but neither soft nor fluffy.

Handling.—Very firm and muscular.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—4 lb. to 5 lb

COLOUR

Beak : Dark olive or black, olive preferred. *Eyes :* Very dark red, dark brown, or black, dark red preferred. *Comb, Face, Wattles, and Ear-lobes :* Black or very dark red, "gipsy" face preferred. *Legs and Feet :* The same as the beak.

Plumage.—Black, with a beetle-green sheen.

SCALE OF POINTS

Type and carriage	20
Head : comb, face, lobes, and wattles, 10 ; beak, 5 ; eyes, 5	20
Colour	15
Feather, quantity of	15
Condition	15
Legs and feet	10
Neck	5
	100

Serious defects : Other than four toes ; single or rose comb ; dubbing ; any deformity.

A few brief paragraphs will suffice for certain fowls only seen on very rare occasions, which can hardly be said to be systematically bred, and which have no qualities likely to bring them into greater popularity, though one or two of those produced in America have shown good points, and might have attained greater recognition but for the appearance of other types with more to appeal to popular favour.

A very strongly marked race without tails, known as Rumpless fowls, has been known for centuries, and is spoken of as such by

Rumpless Fowls.

Temminck, Linnæus, and other naturalists, besides old Aldrovandus. It was known in India and China; and perhaps the most remarkable statement on record is that of the Rev. J. Clayton, so far back as 1693,[*] to the effect that he had observed in Virginia how most of the cocks and hens there were without tails, adding that he was assured English stock also after a time lost their "rumps." Buffon adopted this latter statement; but it is obvious that the effect was simply the result of crossing with the Rumpless stock, which perpetuates the feature with very great persistence. A West Indian gentleman informed us personally, in 1872, that the greater number of fowls in his own neighbourhood had no tails; and this prevalence of such a feature in certain localities is a curious parallel to the Frizzled fowls of the Mauritius, the tail-less race of cats in the Isle of Man, and other instances.

Rumpless fowls are destitute of the caudal appendage sometimes termed the "parson's nose," from which the tail grows, and the spine itself is—at least it is usually—*minus* the final vertebræ. By long descent this characteristic is so fixed that a Rumpless fowl, crossed with any other, generally produces a large majority of Rumpless birds; hence a Rumpless breed can be readily produced of *any* colour and character desired. Thus it is that we see Polish, and Bantams of all colours and breeds, thus distinguished. Careful selection is, however, necessary with these cross-bred birds. Those shown other than in Bantam classes generally average about 5 lbs. and 4 lbs., and always attract attention, but rarely any prizes, being regarded more as curiosities than anything else.

As a rule, Rumpless fowls are very hardy and prolific, those qualities being kept up by the frequent crosses they receive. The saddle and cushion feathers are curled down over the stern, from which cause the eggs of birds in their natural state are often sterile; but if the hen's saddle be plucked to the requisite extent this drawback is removed, and the produce will be found as fertile as usual.

Naked Necks.

Under the name of Naked Necks is now and then seen a very curious variety, with perhaps the most extraordinary characteristic known in any race of poultry. The first specimens we ever saw, and we believe the first to be seen in England, were exhibited by Mr. John C. Fraser in 1874. These birds were imported from Austria, their place of origin being Transylvania, whence several other specimens have since been imported, the last exhibition of them which we can remember being a pen shown by Lord Deerhurst at the Dairy Show of 1900.

The heads of these birds are feathered as usual, but the entire neck is absolutely bare of feathers down to the shoulders, as much so as if plucked, and the skin being of a red colour, almost like that of a healed wound. This red colour is considered in Austria a point of the breed. There is a curious tradition that their origin was in a bird severely *scalded* on the neck, so as to lose all the plumage, the feature being afterwards transmitted; but that this is a mere fancy is shown by the extraordinary tenacity of the point, which is imparted to its crosses with all other breeds of fowl. From such crosses has arisen much variation in colour and other minor points. Black plumage is said to be the most typical. Both single and rose combs are recognised in Austria, but rose combs are preferred. Both faces and ear-lobes should be red. At the shoulder, or bottom of the neck, there is a sort of frill, adorned in front by a tuft of feathers. A writer in *Poultry* states that in Austria considerable importance is attached to this tuft of feathers, as without it the contrast between the bare skin and the plumage becomes rather unsightly, and the bird is therefore reckoned of less value.

The same authority states that the economic merits of this curious fowl are considerable. It is said to be very hardy, a moderate eater, and a good layer, the eggs being of considerable size. It is also a very satisfactory table fowl. The young chicks are said to be particularly hardy as regards thriving in inclement weather, their ancestors having been reared on the rugged slopes of the Carpathian mountains. With such a character, those who desire quaint novelty in combination with really useful qualities might do worse than try this singular breed.

Jersey and Rosecomb Blues.

The Jersey Blue, chiefly found in the State of New Jersey, is little cultivated in America, but managed to get into the Standard in 1888, and is still bred, so that it has at least survived for thirty years since we first mentioned it. The colour is that of the Andalusian, the beak dark, and the eyes dark bay; the shanks dark or slaty-blue, as usual with this plumage. From all the descriptions we have read, and one or two directly received, it appears to resemble the

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[*] Phil. Transactions, 1693, p. 992.

Plymouth Rock in type, with perhaps a rather larger neck and shorter tail, and being a shade larger in size. It also resembles the Rock in general qualities, both as regards laying and table. It appears to have failed in popularity, in comparison with that, owing to the dark shanks and white skin, which in the United States have been less valued than yellow.

Another large blue variety may be mentioned as often exhibited at northern and Midland shows in England, under the curious name of "Likeliest Hen for Laying Purposes." The class thus described was probably meant simply enough in the first place; but the competition seems to have settled down to large birds of Andalusian colour, and generally rose combs, which probably owe their size to Blue Langshan. A hen of this breed was recently sold for twelve guineas. The rose comb differentiates the bird from Langshans and Jersey Blues; otherwise all these large blue birds have much in common. Possibly the breed—for it really approaches that character—which originated in this singular way, may be cultivated presently under some other name.

Sherwoods.

Under the name of Sherwoods a fowl has found considerable favour amongst many practical American breeders, though it has never been admitted to the Standard, probably as not being distinctive enough. The birds themselves have been known for forty years or more, and are spoken of as exceedingly hardy, very tender in flesh, and good layers of large brown eggs. The cocks weigh 9 lbs. to 10 lbs., the hens 7 lbs. to 8 lbs. They are believed to have been first advertised under the present name in 1890. The plumage is all white, the beaks yellow, combs single and straight, ear-lobes red, shanks yellow, lightly feathered to the outside toe. The slight feathering, rather larger size, and the larger eggs appear the chief distinctions between these birds and white Plymouth Rocks. Very similar birds, but with rose combs, have been advertised as "White Wonders," and seem to have much the same relationship to the white Wyandotte. It is obvious that almost innumerable varieties might be produced with such small distinctions as some of those here mentioned can claim; but "breeds" of such a character can have little of real interest or value for the poultry breeder.

Of the fowls here described, beside the Lakenvelder and Sumatra, only Dumpies, Scotch Greys, Silkies, and Sultans have as yet been standardised by the Poultry Club. The Standards for these are as follow:—

SCOTCH GREYS.

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Long and fine. *Beak:* Strong and well curved. *Eyes:* Large and clear. *Comb:* Single, of medium size and fine texture, straight and upright, the back following the line of the skull, and with well-defined serrations. *Face:* Of fine texture. *Ear-lobes:* Of medium size and fine texture. *Wattles:* Of medium length, and well rounded at the bottom.

Neck.—Moderately long, finely tapered, and with profuse hackle flowing on the shoulders and back.

Body.—Of medium length, and compact. *Breast:* Deep and full, carried forward and upwards. *Back:* Broad and comparatively short. *Wings:* Medium sized, well tucked, and with the bow and tip covered by the neck-hackle and saddle feathers.

Tail.—Of medium length, carried well up (but not squirrel fashion), and with flowing sickles.

Legs and Feet.—*Legs:* Thighs long and strong and wide apart, but not quite so prominent as those of the Game fowl; shanks strong and rather long. *Toes:* Four on each foot, stout and strong, straight, and well spread.

Carriage.—Erect and lively.

Weight.—7 lb. to 8 lb.

Handling.—Firm, and almost similar to that of the Game fowl.

HEN

Except that the *Comb* may fall slightly over, the general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—5½ lb. to 6½ lb.

COLOUR

Beak: White, or white streaked with black. *Eyes:* Red. *Comb, Face, Wattles, and Ear-lobes:* Bright red. *Legs and Feet:* White, or white mottled with black, but not sooty.

Plumage of the Cock.—Cuckoo feathered; ground colour of body, thighs, and wing feathers blue-white, and that of the neck-hackle, saddle, and tail feathers varying from blue-white to light grey; barring, black, with a metallic lustre. The marking of the body, thighs, and wing feathers should be straight across, but that of the neck-hackle, saddle, and tail may be slightly angled or V-shaped. The alternating bands of black and white should be of equal width, and proportioned to the size of the feather. The bird should "read" throughout—*i.e.* the shade should be the same from head to tail. The plumage should be free from red, black, white, or yellow feathers, and the hackle, saddle, and tail should be distinctly and evenly barred, while the markings all over should be rather small, even, and sharply defined.

Plumage of the Hen.—This should be almost similar to that of the cock, the only difference being that the markings are rather larger, and produce an appearance somewhat resembling shepherd's tartan.

SCALE OF POINTS

Colour and markings: of hackle, 10; back, 10; tail, 10; wings and across shoulders, 10; breast and thighs, 10	50
Size	15
Type	10
Head	10
Condition	10
Legs and feet	5
	100

Serious defects: Any bodily deformity; any distinct characteristic of any other breed not applicable to the Scotch Grey.

SCOTCH DUMPIES.

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Fine. *Beak:* Strong and well curved. *Eyes:* Large and clear. *Comb:* (*a*) Single or (*b*) rose, the former preferred; (*a*) of medium size, upright and straight, free from side sprigs, and the back following the line of the skull, evenly serrated on top; (*b*) of medium size, straight and firmly set on the head, full of fine work or spikes, level on top, and narrowing behind to a distinct peak following the line of the skull and not sticking up. *Face:* Smooth. *Ear-lobes:* Small and lying closely to the neck. *Wattles:* Of medium size.

Neck.—Of fair length, in keeping with the size of the body, and covered with flowing hackle.

Body.—Square. *Breast:* Deep. *Back:* Broad and flat. *Wings:* Medium sized, neatly carried.

Tail.—Full and flowing, the sickles well arched.

Legs and Feet.—*Legs:* Very short, shanks not exceeding 1½ inches. *Toes:* Four on each foot, and well spread.

Carriage.—Heavy, with a waddling gait, the extreme shortness of its legs giving the bird the appearance of "swimming on dry land."

Weight.—7½ lb.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—6 lb.

COLOUR

Beak: To match the legs. *Eyes:* Red. *Comb, Face, Wattles, and Ear-lobes:* Bright red. *Legs and Feet:* White, except in the Black variety, black or slate, and in the Cuckoo variety mottled.

Plumage.—There is no fixed colour, but the varieties chiefly exhibited are Blacks, Cuckoos, Darks, and Silver-Greys, the last three being similar to those varieties of the Dorking.

SCALE OF POINTS

Type	40
Size	20
Head	15
Condition	15
Colour	10
	100

Serious defects: White ear-lobes; yellow or feathered shanks or feet; other than four toes on each foot; long legs; any deformity.

(NOTE.—In former editions of the "Poultry Club Standards" there is a special note to the effect that "shortness of leg alone should not constitute their claim to notice; they must have large, low, heavy bodies, and other points of excellence." Most judges and fanciers will agree, however, that unless Dumpies have very short legs, giving them the dumpy appearance, they can scarcely merit their name.—W. W. B.)

SILKIES.

GENERAL CHARACTERISTICS

COCK

Head.—*Skull:* Short and neat, and crested. *Crest:* As upright as the comb will permit, soft and full, and not showing any hard feathers, having half a dozen soft, silky feathers streaming gracefully backward from the lower and back part of the crest to a length of about 1½ inches. *Beak:* Short, and stout at the base. *Eyes:* Brilliant, and not too prominent. *Comb:* An almost circular cushion of flesh, with a number of very small prominences over it, and having a slight indentation or furrow transversely across the middle. *Face:* Smooth. *Ear-lobes:* More oval than round. *Wattles:* Nearly semicircular, not long nor pendent, and concave.

Neck.—Short or of medium length, broad and full at the base, and with abundant and flowing hackle.

Body.—Stout-looking. *Breast:* Broad and full. *Shoulders:* Stout and square, and fairly covered with the neck-hackle. *Back:* Short, with the saddle rising to the tail. *Stern:* Broad, and abundantly covered with fine fluff. *Wings:* Soft and fluffy at the butts, the ends of the flights ragged and fairly covered with the soft saddle-hackle.

Tail.—Short, very ragged at the ends of the harder feathers of the true tail, and sickles (allowable) if to be seen, not too noticeable nor too hard.

Legs and Feet.—*Legs:* Short, the thighs set wide apart, covered with very abundant fluff, and standing out prominently; the shanks smooth and free from scaliness, and with slight feathering on the outer sides. *Toes:* Five on each foot, the fourth and fifth diverging from one another preferably, and the middle and outer toes feathered, but these feathers, like those on the shanks, not too hard. There should not be vulture hocks, but soft, silky hocks are permissible.

Carriage.—Stylish.

Weight.—3 lb.

Plumage.—Very silky and fluffy, with a profusion of hair-like feathers.

HEN

Head.—*Crest:* Similar to a powder puff, standing up and out, not inclined backward, nor hanging over the eyes nor split by the comb, and devoid of hard feathers. *Comb:* Small, and hardly noticeable under the front of the crest. *Wattles:* Either absent or very small and of oval shape.

Neck.—Short.

Body.—Saddle broad, and well cushioned with the silkiest of plumage.

Tail.—Small, nearly smothered by the cushion, the ragged ends alone protruding, and inclined to be of the Cochin type.

Legs.—Especially short, and the under fluff and thigh fluff almost meeting the ground.

In other respects the general characteristics of the hen are similar to those of the cock.

Weight.—2 lb.

COLOUR

Beak : Slate blue. *Eyes :* Black. *Comb, Face, and Wattles :* Purple black. *Ear-lobes :* Preferably turquoise blue, the next best colour being purple-black, similar to the comb, face, and wattles. *Legs and Feet :* Lead, with the toe-nails blue-white. *Skin :* Deep violet.

Plumage.—Snow white.

SCALE OF POINTS

Head : comb, 10 ; face, 10 ; eyes and lobes, 10	30
Plumage, texture of	20
Type	20
Saddle and hackle	10
Neck	10
Legs	10
	100

Serious defects : Hard vulture hocks ; green beak or legs ; green tip to beak ; ruddy comb or face ; other than black eyes ; incorrect colour of plumage or skin ; plumage not silky ; want of crest ; Polish, or split crest ; single comb ; long back ; want of fluff ; scaly legs ; four toes ; featherless shanks and feet ; green soles to feet.

SULTANS

GENERAL CHARACTERISTICS

COCK

Head.—*Skull :* Of medium size, with a decidedly pronounced protuberance on top, and crested. *Crest :* Large, globular, and compact, and composed of feathers similar to those of the hackles. *Beak :* Short and curved, and having large nostrils rising above the curved line of the beak. *Eyes :* Bright. *Comb :* Of the horn type, V-shaped, very small and almost hidden by the crest. *Face :* Covered with thick muffling. *Muffling :* Very full, the beard and whiskers joining, running into the crest. *Ear-lobes :* Small and round. *Wattles :* Very small and hardly perceptible.

Neck.—Somewhat short, carried well back, and covered with abundant hackle.

Body.—Square and deep. *Breast :* Prominent. *Back :* Short, straight, and broad, and drooping to the tail. *Wings :* Large, long, and carried low.

Tail.—Long and fine, and carried open, the sickles very long, with abundant hangers and coverts.

Legs and Feet.—*Legs :* Short, the thighs stout and furnished with heavy vulture hocks to cover the joints, and the shanks heavily feathered inside and out. *Toes :* Five on each foot of moderate length, and completely covered with feather.

Carriage.—Very sprightly.

Weight.—6 lb.

Plumage.—Long, abundant and fairly soft.

HEN

The general characteristics of the hen are similar to those of the cock, allowing for the natural sexual differences.

Weight.—4½ lb.

COLOUR

Beak : Pale blue or white. *Eyes :* Red. *Comb, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Pale blue.

Plumage.—Snow white.

SCALE OF POINTS

Crest	15
Muffling	15
Colour	15
Leg and foot feathering	15
Condition	15
Type	12
Size	8
Comb	5
	100

Serious defects : Coloured plumage ; other than five toes ; wry tail or any other deformity.

RHODE ISLAND WHITES

THE success which followed upon the introduction of the Rhode Island Red to this country from America doubtless had much to do with the appearance at the Crystal Palace show of 1913 of a class for Rhode Island Whites. Twelve exhibits were entered, and showed fair evidence of possessing good utility qualities. Opinions, however, differ as to their right to the title of "Rhode Islands," and the well-known American poultry writer, Mr. J. H. Drevenstedt, protested strongly in *The American Fancier* against their usurpation of the name, and drew attention to the confusion likely to arise from having four varieties—white Rocks and single-comb Rhode Island Whites ; white Wyandottes and rosecomb Rhode Island Whites—in which the only distinguishing feature would be *shape*.

The following notes upon the breed are from the pen of Miss C. A. Reid-Powell, of St. Ives, Ringwood, Hants :

"This breed owes its origin to the following crosses : A Cochin hen was mated to a white Wyandotte cock ; the pullets from this cross were mated to a Cochin cock, the offspring of which were one-fourth white Wyandotte and three-fourths Cochin. The pullets were then mated to a rosecomb white Leghorn, the result of which is the subject of this sketch.

"The Rhode Island Whites inherit from the Cochin family their beauty and plumpness, from the white Wyandotte their docility and phenomenal egg-laying qualities, especially during the winter months, and from the Leghorn their excellent laying powers during the summer. These qualities, together with the fact of being a first-class table bird, indicate the general all-round utility of the breed. In addition to the foregoing, the Rhode Island Whites have obtained their activity from the Wyandotte and Leghorn families, and their quick maturity from the Leghorn, although the Wyandotte is to a certain extent responsible for this also. As one American breeder puts it, 'Now, what is lacking? Here we have meat, eggs, and beauty; a superabundance of each. What more could we ask for in a fowl?'

"The principal point to remember in breeding Rhode Island Whites is the cultivation of a long-backed bird, for no matter how good otherwise, the long-backed birds have always shown themselves to be the better egg producers."

Rhode Island Whites, like the Reds, are to be found with both single-combs and rose-combs, the former of those first exhibited here perhaps showing the better type. The shape, carriage and size of the Whites are similar to the Reds, to which also the standard of the Rhode Island White Club of America closely approximates.

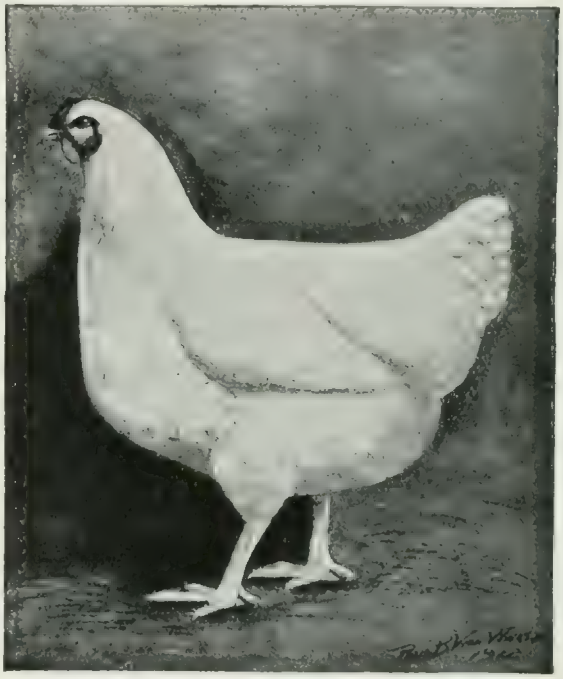
The plumage throughout should be pure white to the web fluff and quill; the beak, shanks and toes are rich yellow: eye, reddish bay; comb, face, ear-lobes and wattles, bright red. Disqualifications in exhibition birds are feathers other than white, ear-lobes which are more than one-half positive white, feathers on shanks and toes, and these latter any colour but yellow.

The standard weights are the same as for the Reds, viz.: Cock, 8½ lbs.; cockerel, 7½ lbs.; hen, 6½ lbs., and pullet 5 lbs. As essentially a utility fowl, the standard lays down that the breast of both male and female shall be broad, deep, and well rounded, with a broad, long back carried in a horizontal position. The legs should be set well apart, and be of medium length. The general appearance of the Rhode Island White is a long-bodied, active fowl, with straight, horizontal back, and with the tail in the cock carried at an angle of 40 degrees, and in the hen of 35 degrees, this impression of length of body is increased. It is too early yet (1914) to say what the future of the Whites will be in this country, but if bred for the object for which they were originated—good layers and table birds—their utility qualities should secure them a favourable reception.

THE SICILIAN BUTTERCUP

THIS fowl, though, like the Leghorn, of Mediterranean origin, reached England via the United States. It was imported here in 1912 by a few enthusiastic fanciers who had heard of its merits, and a club was formed in July, 1913, and at the first club show, held at the Crystal Palace in the same year, eighty-one birds were exhibited in three classes.

Upon the origin of the breed we are indebted for the following notes to Mr. J. C. Chambers, of Elstree House, Redhill, Surrey, who writes:



The American Club's Ideal Rhode Island White Hen.

"The Buttercups were first introduced into America by Captain Dawes, who used to trade between the island of Sicily and Boston, U.S.A., on the barque *Fruiterer*. On one of his voyages home, and previous to sailing, he went into the market and bought a coop of fowls for the purpose of having fresh meat (there were no refrigerators in those days) while on his journey. Shortly after the ship sailed the fowls began to lay eggs of a rich and delicate flavour. They laid so continuously, and eggs being as much of a luxury as fresh meat, Captain Dawes determined not to kill them, and finding, amongst their other good qualities, that they were of a very gentle and quiet disposition, he decided to take them home to his father's farm.

"From this source Mr. C. Carol Loring, an American breeder, secured his stock, and gave them the name of Buttercups, from the peculiar shape of the comb, which is neither rose, pea nor single, but is formed like a cup on the top of the head, with spikes or points standing upright in a circle, somewhat resembling a flower. Mr. Loring bred them for many years, and improved their plumage and general appearance, so as to make them a more finished breed; but they gradually dropped out of favour in the States, through no one caring to advertise or boom them in any way, and also owing to inferior importations, some coming with yellow legs instead of green, combs of irregular shape, and every description of bad pencilling.

"Some time afterwards better specimens of the type, with good markings, were imported to America, and carefully mated to the choicest of the stock then there, and gradually the imperfections were eliminated, and from about 1909 onwards the popularity of the Buttercup in America steadily increased, and capital classes were exhibited at the great New York and Boston shows."

Mr. Chambers has imported stock both from America and Sicily, and advises that anyone taking up Buttercups must remember that they are difficult birds to breed true to type or colour, and to produce a perfect comb, and it must not be expected that a large percentage of stock raised will come yet up to the exhibition standard; for Sicilian Buttercups belong *par excellence* to the utility class, and will not be a finished show bird for some years to come, as, indeed, the continued alterations in the standard serve to indicate. He adds: "Their utility qualities are beyond question, as they have been bred for many generations in Sicily, and over fifty years, on and off, in America. Their eggs are generally white; occasionally some may show a slight tint. They are small eaters, and great foragers if they have a free run, and are practically non-sitters. They mature very early (from three to five months), are extremely vigorous and hardy, small-boned, easily fattened, unsurpassed as broilers, and their meat is of the highest quality. The standard weights are: Hen, from 4 to 5 lbs.; cock, 5 to 6 lbs.; but these weights have been exceeded by as much as two or three pounds respectively in America."

Upon the antiquity of the Buttercup, with its distinctive comb, Mrs. A. N. Dumaresq contributes an interesting note to the American Buttercup Club's 1914 Year-Book. She writes:

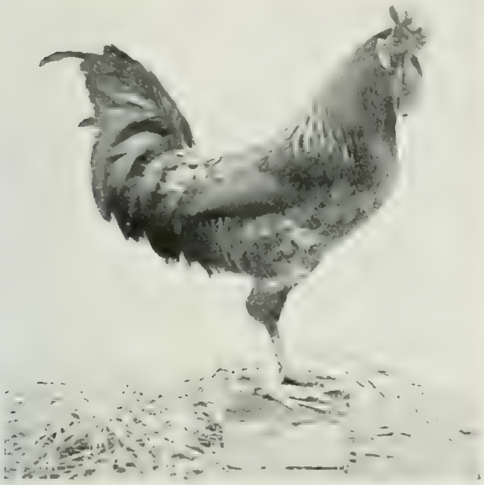
"It may interest readers to learn that this busy little fowl has held court for centuries in their native country, as well as in France. You will find, among the many pictures of different breeds of fowls, the Sicilian (or Buttercup) as the most conspicuous. The Ancona is also seen, and many other breeds, painted by artists of note. For instance, in the Borghese Gallery (the most important next to the Vatican) you will find Anconas and Sicilians (or Buttercups); in the Vatican Gallery the same, dating back to the sixteenth century, painted by a noted Spanish artist named Spinello, if I remember correctly. In Paris you will find a fine oil painting of them. In the National Art Gallery in Florence you will find them also."

A marked characteristic of the Sicilian Buttercup is its docility, due, doubtless, to its long and close association with the Sicilian peasants, in whose homes it wanders in and out as free as ever did the "gentleman who paid the rent" in Irish cabins. This docility is useful, and should be encouraged, for many excellent breeds have lost popularity through their wildness; and that it is present the Editor of this work had an illustration of whilst writing these notes, in the shape of a cock and a pullet brought up for him to see by Mr. Wm. Toozes, junr., the Secretary of the British Sicilian Buttercup Club. These birds, picked up from a free range that morning, brought fifty miles on a motor-car, and penned on our office table, were as unconcerned at their novel surroundings as any veteran show-goers could well have been.

It appears necessary, however, if real progress is to be made with the Buttercup, that a permanent standard should soon be arrived at, and particularly as regards the females; and the point is well put by Mrs. H. J. Carr, in the American Club's Year-Book, who writes:

"Changes in the standard from year to year are hard on the careful breeder and a detriment to progress. For this reason, it seems to me, the quicker all necessary changes in the standard are made, and the quicker the standard is made to embody all the requisites of the ideal Buttercup—as it will be, say, in ten years from now—the quicker will we learn how to breed good Buttercups, and the more rapidly will the breed improve.

"Our standard calls for females having plain buff breasts and necks, with spangled feathers on back. This is very desirable, but birds showing the beautifully spangled feathers, so much to be desired, with good wing and shoulder marking, do not show the clear breasts; while clear-breasted birds are quite likely to be deficient in wing markings, and show both laced and spangled, or all laced feathers on back.



Sicilian Buttercup Cock.
1st Wolverhampton and Guildford and 4th Palace; the property of Mr. J. C. Chambers.

"This might, perhaps, with care, be overcome, and I for one am quite willing to try to do so, but if marked breasts are ever to be allowed, which many seem to think probable, why not now? I much prefer the nice clean breasts myself, if it can be obtained in connection with good markings.

"If we wish to breed females having the spangled feathers, care must be taken in selection of male birds. I have bred Buttercups exclusively for several years, and caring for them myself and being with them every day in the year, I have studied them a good deal. I have not been able to find that males bred from hens showing spangled feathers have any marking to distinguish them from those bred from laced females. The pencilled saddle on male may indicate lacing on female. It is, then, quite necessary, if we wish to improve our birds, to know the parentage of the male bird used in our breeding pen, for many a good-looking bird, well up to the standard, is hatched from a female very poorly marked indeed.

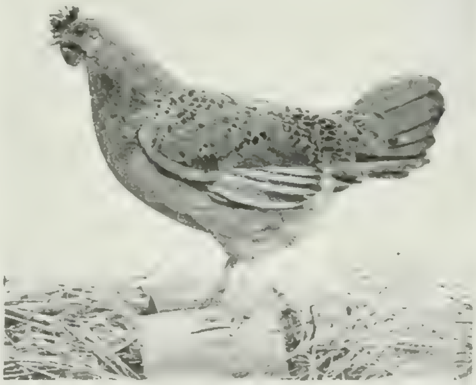
"Our nicest females mated with a male bird hatched from a poorly marked female, will give us a large percentage of poorly marked stock."

Another American breeder, Mr. E. E. Reynolds (faced by the difficulty alluded to by Mrs. Carr of securing good, sharp markings on top in the hens with clear breast colour beneath), practises double-mating, which, if really necessary to get standard points, will seriously affect the lasting popularity of the breed. The partly white and red ear-lobe he found another difficulty, and writes:

"Nearly all the Sicilian chicks will show a greater part of ear-lobe white while young, say four months. After that they will begin to change and become almost red, or only showing a little white. I have found by breeding from a male whose ear-lobe is a mixture of half of each will give much better results both in males and females, and will not as a rule show any white in their offspring.

"Breeding for males and females, I have found it impossible to produce the proper colour and markings from one mating. Therefore, I have used double-matings for four years.

"For cockerel breeding I use a cock with rich, even, dark red all over; clean breast with plenty of black between shoulders, with black wing flights and tail and spangled on fluff with undercolour dark slaty, but never use a male for cockerel breeding with black in breast or in wings nor one showing any greenish bars on outer surface of wings. The females I use for this mating are two-year-old birds of partridge marked backs with some lacing in hackle, and dark in sides of breast and fluff.



Sicilian Buttercup Hen.
1st (cock and hen class) Palace and 1st Wolverhampton; the property of Mr. J. C. Chambers.

"For pullet breeding I use a cock bird of a light red, even surface colour all over, hackle back and saddle with light salmon breast, solid colour (no black), undercolour about half slate and buff, with black wing flights and tail, and one showing distinct black spangling between shoulders and on fluff. The more of this the better the results. I use one- and two-year-old females for this mating with clean, clear hackle and breast and of medium barring on backs and some spangle under wings and on fluff, with as dark wings and tail as you can find. I use females that show the blackest barring and spangling with a clear surface or buff between these barrings.

"The cockerels produced by this mating are the majority much too light in colour, some of them showing hackle of cream colour, almost white, and undercolour being very light buff with no dark or slaty colour, and are practically of no use as breeders."

Against this experience we have not yet had time to test whether the standard cannot be attained by the better method of single-mating, and for the sake of the breed, if this is not feasible, we should suggest its alteration rather than the adoption of the fatal policy of double-mating in a utility breed.

Seen together, the Buttercup cock and his mate are strangely dissimilar in colour, and, as Mr. Toozes puts it, at first sight the male might be taken for a light type of Rhode Island Red, except, of course, for his distinctive headgear.

The Buttercup cock's surface colour should be rich deep red or bay; the main tail feathers and sickles are black with greenish sheen; tail coverts black, becoming red as they approach the saddle; wing flights, black and reddish brown. The American Club's standard from which the British was adopted, adds: "Undercolour clouded on back and sides with shades of grey. Butterish sheen on neck and saddle. Spangles in under base of hackle, and in fluff at end of wing."

In both sexes the beak should be yellow and black; eyes reddish bay; comb, face and wattles, bright red; ear-lobes red and white, in the hen red to be the predominating colour, not more than two-thirds white permitted; shanks and toes, willowy green.

The plumage of the Buttercup hen is very unlike that of the cock, being generally a golden buff mottled on the back with well-defined black spots. The breast is a paler shade of golden buff free from markings running lighter in the fluff, and the tail and wing flights are black and reddish brown.

Disqualifications in the English standard are "shanks other than green, feathers on shanks or toes, all white in ear-lobes." To these the American standard adds: "Centre sprigs in comb and white feathers (all indications of white)."

The comb, that distinctive feature of the Buttercup, is thus described: "Single as it leaves the beak, single not to exceed three-quarters of an inch, then spreading into a low circle surmounted with numerous spikes. The general form to be cup-shape, size moderate, and serrations even and well defined." The Americans state that the two spikes at rear of comb should be broader than the rest. The comb of the hen is very similar to the cock, but of more modest dimensions.

In carriage Buttercups are sprightly and active as bespeaking good foragers, and the long body and back sloping down from the shoulders with tail of medium size carried at an angle of 45 degrees, broad, well-rounded breast, and well-set legs of moderate length denote a useful fowl for general purposes, suited either to free or confined range.

The males, so far, appear nearer the standard than the females, and for breeding the latter Mr. W. J. Toozes gives the following advice: "The first parts I look for in picking out the future breeders of winning Sicilian Buttercups are as follows: Starting with the comb, I select birds possessing those with smooth centres and free from sprigs, and—most important—see that the breast colour is quite clear without any markings. The main tail feathers should be black with greenish sheen, the legs and toes willowy green, the ear-lobes red and white (not one colour), and as a point to anticipate the future English standard, the hen's back should be a clear buff with clear black elongated spangles."

CHAPTER XXXIV.

BANTAM BREEDING. GAME BANTAMS.

AT no period in the history of the Poultry Fancy have Bantams reached such a popularity, or carried with them such a monetary value, as they do at the present time, so that show promoters in certain places are giving them exhibitions to themselves. Bantam breeders comprise, however, a fancy and world of their own, for which reason we have thought it better for this section to be treated throughout by some single special authority. Though not, as in other cases, distinguished by quotation marks, owing to their length, this and the following chapter upon Bantams are therefore written throughout by Mr. P. Proud, of Birkdale, Southport. Mr. Proud is so well known to every Bantam breeder, not only as an exhibitor, but as a popular judge, a critic, and writer upon this subject, that nothing further need be added beyond our gratification that he has found it possible to render us and our readers his valuable assistance.

The reasons for the great advance in popularity of Bantams are perhaps likely to increase rather than diminish. They can be kept as pets by ladies, young people, and others who would never trouble with larger breeds. They can be reared in hundreds, where medium-sized fowls can only be kept in dozens. They stand a town life well, and a few can be kept successfully in a small garden, or backyard, or, on a pinch, in pens in an attic. They are small consumers, and lay profitably for what little they eat. They are well catered for at all the best shows, and the returns from prizes won are, *pro ratâ* with the expenses of carriage incurred to and from exhibitions, greatly in excess of what could be expected from heavier breeds. Take for instance a consignment of six or eight Bantams, each in separate sections of a properly divided hamper; it costs only about 3d. or 4d. per bird in carriage from the north of England to London and back. At a show like the Dairy or Palace, the exhibitor, for about the same carriage as he would have to pay for one Rock or Orpington cockerel, can compete for six or eight prizes. Finally. Bantams are now kept so much by ladies and gentlemen of rank, with Queen Alexandra at their head, that this also has been no small factor in popularising these beautiful and interesting birds.

Hatching Bantam Eggs.

In some respects Bantams require rather special management, and there are some special difficulties in hatching and rearing Bantam chicks. The selection of a suitable broody hen is highly important, unless the Fancier wishes to go in for a small reliable incubator, for such are now to be obtained from some of the best incubator makers; but an inferior machine is no possible use for hatching Bantam eggs, and the temperature for same must not exceed 102°. For years I was greatly troubled by my hens breaking two or three eggs in every sitting, and crushing chicks when on the point of hatching, simply because they were too heavy and clumsy for Bantam eggs. At last I hit upon that cross between the Silkie and Pekin described in the next chapter. These pullets proved excellent sitters and mothers, and for hatching and rearing Bantam chicks are worth their weight in gold. They rarely lay more than a dozen eggs before becoming broody, and then they will sit till further orders; although it is not wise to let them hatch more than two broods at one sitting. As to the nests, where possible it is far the best to have a separate house for sitting hens, where the inmates can be left perfectly quiet. For nests I use orange boxes, which can generally be purchased for twopence or threepence. These I lay down on their sides, and nail a strip of wood along the front at the bottom. I then put in a plentiful supply of fine soil or sand, and on the top of this clean soft hay, the more the better, making the nest the shape of a shallow basin. In the early months—January, February, and March—never give the hen too many eggs; rather put down too few than one too many. Later on you may safely put down fourteen or fifteen. During the time the hen is sitting her food should consist of Indian corn, and she should be moved from the nest every day for ten or fifteen minutes. Before setting the hen give her a good dusting with insect powder, and again two or three days before she is due to hatch; by so doing you will save many a chick from being infested with lice. In the sitting-house have a large shallow box filled with cinder ashes for the hens to dust in. After five or six days the eggs should be tested by a candle in a dark room. Hold the egg between the first finger and thumb of each hand about an inch from a lighted candle. If the egg is unfertile it will appear quite clear, whilst if it contains the germ this will be found to float and show the veins quite plainly. At the end of nineteen days, if the eggs are fresh, they will commence to hatch, and at this time the hen should be left alone; do not bother her more than you can avoid. When possible always use fresh eggs for hatching; and never more than eight or ten days old, if you would have strong chicks. Never set very small eggs, or thin-shelled eggs, for even should they hatch the chicks will be fragile little mites that it is impossible to rear.

Rearing Bantam Chicks.

The next important point is the feeding of Bantam chicks. For the first twelve hours after hatching the chick does not require any food; in fact, they are better without for twenty-four hours; let them remain perfectly quiet. At the end of that time give them their first feed of hard-boiled egg chopped fine and mixed with stale breadcrumbs and coarse oatmeal, or what is termed "pin-head oatmeal." This should be their staple food for the first two days, given every two hours. On the third day substitute Biscuit Chicken-meal for the egg food. The food must be free from condiments or spices, which are harmful to Bantam chicks, however good they may or may not be for stronger chicks. In cold weather it is best to give the food warm, mixing it with boiling water; but in warm weather I find it keeps sweeter when mixed with cold water. Feed every two hours until ten days old, then four or five times a day until they are ten weeks old; then three times a day will suffice. When the chicks are three weeks old let the last feed of the day be broken groats, millet-seed, and canary-seed mixed. At noon a little lean meat cut fine, or a few maggots, should be given. This once a day; but do not give too much: and above all feed your chicks regularly at a given hour each day. If the chicks have free range on grass, water is not necessary. I am not a believer in water for chicks, except what they can get off the grass after a heavy dew or shower. The less water you give chicks the less diarrhœa and gapes you will have amongst them. If you never give them water, they never require it; but once you start to do so you must go on to the end of the chapter. Although the little chick does not require water, however, the hen must not be forgotten. It is best to fasten an ordinary zinc drinking tin for her inside the coop, about 6 or 8 inches from the ground. And, of course, when the chick attains the age of three or four months, when its food will be principally hard corn, then water is necessary. At this age the chickens should be separated, the cockerels from the pullets. When feeding the chicks in the early morning give the hen a good feed of maize, otherwise she will eat all the food away from the chicks.

Keep the coops scrupulously clean, and lime-washed every five or six weeks, and remove to fresh ground every two or three days. Examine the chicks at intervals for lice, etc., and whenever infested, dust well with insect powder. Following these instructions, the rearing of Bantam chicks will become quite an easy and pleasurable task.

Houses and Runs for Bantams.

I am often asked what size of house Bantams require. For a pen of half a dozen, the house should measure 4 by 3 feet. From the floor to the eaves should be 2 feet, and 6 or 8 inches more to the ridge of the roof. Under the floor have a shelter reaching 15 or 18 inches from the ground, and boarded all round except the front. This shelter will be very useful in bad weather, and should have a plentiful supply of moss litter or dry sea sand; this will keep them dry, and prevent colds when the weather is bad. The run attached to the house should measure 9 feet by 3 feet, 5 feet high, boarded 18 to 24 inches from the ground at the front, the remainder of the front wire netting; back, end, and roof boarded. On the floor of the run, also floor of house, use dry sea sand, and rake over every alternate day, so as to keep it clean and sweet. Use round perches for Game Bantams, about the thickness of an ordinary broom-handle; but for feather-legged varieties flat perches are best, and the perches should be so constructed that they can readily be taken down and cleaned. Houses and runs such as described can be put up for 25s. to 35s. each. See that the houses are well ventilated near to the roof; this is highly important for the health of the birds.

Many a good bird is spoiled for the want of proper training, which is half the battle in the exhibition pen. Take a cockerel direct from his run and place him in an exhibition pen, put your stick inside, and endeavour to touch him, and the chances are that he will dash madly against the sides and top of the pen in his endeavour to get away.

Training for Exhibition.

A little care and trouble at the right time obviates all this, and when once properly done, it is done for the bird's lifetime.

In the first place get an ordinary 18-inch exhibition pen, which will cost about 2s., and fix this pen, or your set of pens, on a bench about 4 feet from the ground. Take the bird at night-time and place him in the pen, letting him remain quiet all night to get used to the pen. Next morning approach the pen gently, and feed him through the wires, tempting him with a little bread-and-milk sop, which all birds are passionately fond of. He will be very shy at first, but by degrees will come boldly up. Feed him again at noon in the same way, and at night, when it is dark, take a candle and go and stroke him gently from the top of his shoulders to the tail with your hand, speaking kindly to him all the time. It is surprising how much tamer a bird is by candle-light than he is in day-light. When you have succeeded in getting the bird to stand perfectly still while stroking him down the back, commence stroking him down the breast from the throat. Do this as gently and slowly as possible. When he has got accustomed to this too, instead of the hand use a small cane or stick, but always gently and quietly. Should the bird be inclined to carry his tail too high, by stroking him down with the stick to the end of his tail, the tail-carriage can be greatly improved. When a bird is well trained, he will lower his tail immediately the stick touches his back. They acquire a habit of slightly walking away from the stick, and naturally lower the tail to be free from it. Should the bird droop his wings, which is often the case, then I touch him with the stick under the wings, at the same time lifting them up, and induce him to tighten himself up into proper shape before I leave off. These faults can easily be remedied if the training is persevered with for a few minutes two or three times daily. Should the bird be wanting in style, a few gentle taps on the back of the legs and toes will quickly make him step out like a well-drilled soldier. To give "reach" to Game Bantams, get a little tit-bit of meat, or bread and milk, and hold it *high up* in front of the pen to induce the bird to reach up. He will perhaps not come at once, but a little patience will gain the day, and he will come boldly up whenever you approach the pen. Some birds take much more time than others When they have been well handled in chickenhood, they require very little training; and again, the more highly-bred the easier the training.

The next step towards perfecting Bantams for the exhibition pen is washing. All birds do not require actual washing: those of dark plumage need only be sponged over with tepid water prior to packing them off.

Washing Bantams.

Moisten a sponge well, and thoroughly sponge the bird over, and afterwards dry thoroughly by a brisk stroking in one direction with a *silk* pocket-handkerchief. It is surprising what a "polish" can thus be put on the feathers of any dark birds such as Black Rosecombs, Black- or Brown-red Game, etc., which look quite fifty per cent. better.

Whites and all light-coloured varieties require to be thoroughly washed, a process so fully described in a former chapter that few words are needed here. Three separate bowls of water are required; the first to contain soft water as hot as you can comfortably bear the back of the hand in; the second slightly cooler; and the third just tepid. Place the bird in the first with his head just clear of the water, and soak him thoroughly; then soap him well with Sunlight or white-curd soap until you get a good lather, and freely rub it into the feather; then sponge well with the hot water, and repeat this operation until all trace of dirt has disappeared. Then in the second bowl sponge him well with the clean water until all the soap is removed; and finally transfer him to the finishing bowl containing the tepid water, and rinse him well from head to tail, sponging him all the while. After absorbing all the water out of the feathers that you can with the sponge, dry the bird with a soft towel, then place him in an open wicker basket or wire pen containing clean hay, placed about 3 feet from a good bright fire, and allow him to remain there until dry. It is as well to place a cover round the back of the hamper or pen to protect him from draughts. In hard-feathered varieties it is a good plan, when the bird is *nearly* dry, to take him out and give him a good rubbing with a *silk* handkerchief to get the desired polish, which would not be obtained if left to dry by itself. It is best to wash the birds at least two clear days before they are required to be sent to the show, to give the feather time for webbing out again.

In despatching birds to a show, see that the basket is clean and weather-proof, in winter using good *thick* lining: this is very important for Bantams. Just before a bird is sent off, give him a good feed of warm bread and milk, and the same as soon as he returns. On his return, keep him isolated for two or three days as a precaution against the spread of any disease he may possibly bring back, though you hope not. But one never can tell what disease a bird may have contracted at a show, and the introduction of roup or diphtheria in this way might be ruinous to a yard.

Apart from outside infection, Bantams being in-bred to a great extent, are weaker, and more liable to certain diseases than their bigger brethren. The most common ailments from which they suffer are colds and roup, the latter being nothing more in its milder form than a neglected cold. When a bird is noticed to have a cold, or running at the nostrils, the best remedy is a dose of Roup Powder in the drinking water daily for three or four days, which will be quite sufficient to stop the cold. This treatment will generally cure a cold in a few days if the bird is kept free from draughts. Keep houses well ventilated and cleaned out regularly each week. Twice a year the interior should be lime-washed. Birds suffering from roup should be isolated from any others to prevent the disease spreading.

The most serious trouble the Bantam fancier has to contend with during the breeding season is egg-bound. This generally occurs in finely-bred, small, and extra neat Game Bantam pullets. The sooner it is noticed the better. If the pullet is noticed to go to nest frequently in one day, it may be assumed that she is finding difficulty in passing her first egg, and it is by far the best to take her in hand before she has exhausted her strength in her own endeavours. In ordinary cases all that is required is to place the hen up to her thighs in hot water, as hot as you can bear your hand in, and let her remain for ten minutes; then dry her with a towel, and grease the vent well with vaseline. If the egg is in view, a little gentle pressure from behind outside with the thumb and fingers will generally eject it, but very great care should be exercised not to break the egg, or the result will prove fatal in nine cases out of ten.

In concluding these general hints and instructions, let me add a few "Don'ts," which Bantam fanciers will do well to note.

Don't commence by buying several first-prize winners from here, there, and everywhere, with the idea that as the parents are all first-prize winners the produce will be the same. You cannot make a graver mistake. Start with some reliable strain, and stick to that strain alone, and in-breed so long as your chicks are fairly healthy and vigorous. By so doing you are keeping the blood pure and building up a strain of your own at the same time.

Don't think that you are going to rear strong healthy chicks, bred from birds that have been doing the rounds of shows all the season. You cannot do it. Don't exhibit your *breeding* birds at all; then you will have healthy chicks and fertile eggs.

Don't put more than five hens to a cock, especially during the first two or three months of the breeding season, and don't mate up the cock to the hens until January. Keep them apart.

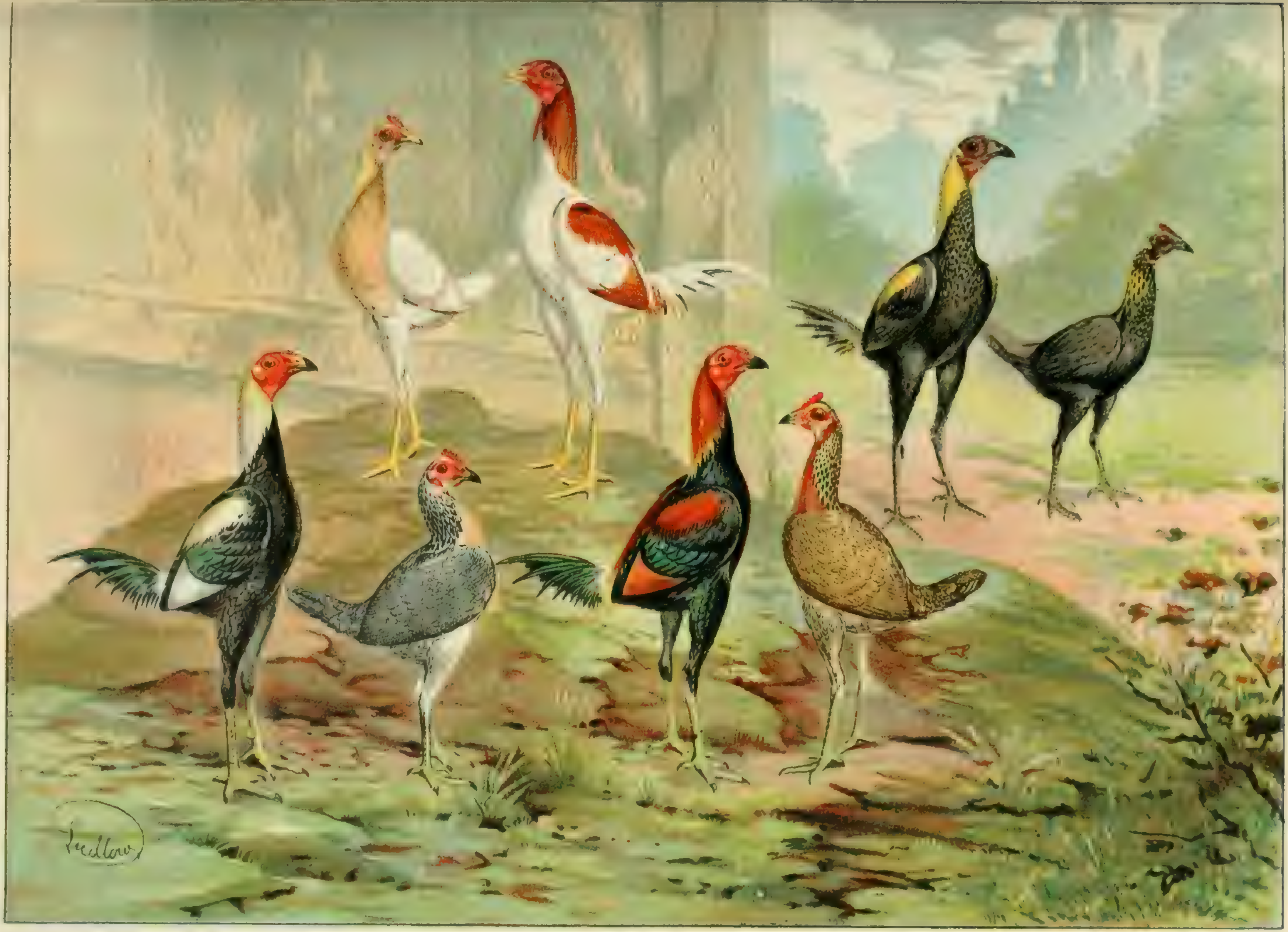
Don't overcrowd and don't pamper your chicks; give them plain wholesome food, and feed regularly.

Don't neglect to dust your chicks frequently with insect powder during the summer months. Many thousands of Bantam chicks, even in greater proportion than the large ones, are lost annually through being infested with lice.

Game Bantams.

No one will dispute the fact that of all Bantams the Game varieties must take precedence. Of all the different kinds bred, none seems to secure the popular vote like these. Fanciers may drift into other varieties, but as a rule they begin with Game. Fearless little creatures they are, with a pluck and courage all their own. No wonder they stand first favourites! The colours allow a liberal margin for the exercise of individual taste, though Black-reds, Duckwings, Brown-reds, and Piles have so far made the greatest advance towards perfection, followed by Birchens and Whites. As a rule Black-reds and Piles give the heaviest returns for the capital and labour expended upon them.

In judging Game Bantams, shape and style come first. In both male and female we want somewhat of the laundry flat-iron type, i.e. a wedge shape, with no great keel, and tapering from a square prominent front sharply to the tail. The shoulders should stand out squarely, the wings short and rounded and tucked well in to the sides, not flat-sided. If the wings are carried on the back, the bird is said to be goose-winged, which is a serious fault in the show-pen. The back should be as short as possible and flat. A round back is an eyesore, and practically a disqualification. The thighs must be round as well as long. A flat-shinned bird comes of delicate parentage, and will breed flat-shinned ones. The thighs should be set on well apart, as this affects greatly the Game-like look of the movements of the bird.



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PILE.

10 SILVER DUCKWING. BLACK-BREASTED RED. BROWN-BREASTED RED

GAME BANTAMS

The shanks must be long, fine, and round in bone, clear and smooth, and terminated in long straight toes with good claws. The hind toe should be planted firmly on the ground in a straight line with the centre front toe, any screwing about to right or left, or inwards, is termed duck-footed, and is a certain disqualification in the show-pen. Sometimes in very reachy birds the back toe proves a trifle short, but this is a minor fault compared with the other. The tail is a special feature. It should rise to a little above the horizontal, and the twelve feathers of which the tail proper is composed should be whipped together as closely as possible. The whole feathering from head to tail should be of the shortest, narrowest, and scantiest; and in the body and tail feathers as strong in quill and as wiry to the touch as possible. The sickles and hangers have been bred to a surprising narrowness, and very short, so that the former only protrude beyond the tail proper about a couple of inches. The head should be long, lean, and snaky, with a long, strong, slightly curved beak, and a full, defiant, eagle-like eye, placed just under the top of the skull. Look for a long and fine neck, with bright, narrow, short hackles, and very upright or perpendicular carriage.

Colour is a great desideratum, and should come next. A rich colour, giving wide contrast, greatly enhances the appearance of a bird. In the males there should be no rustiness, especially about the shoulders, wing-bars, or hocks. The standard colours of the different varieties will be described as we proceed.

Size, or want of it, is a very important point, but diminutiveness may be overdone. All other points being equal, the smallest bird would undoubtedly win in the show-pen, and for this reason small birds are much in request, and command excellent prices. But very small pullets are by no means desirable in the breeding-pen. Three possibilities may arise. The first is they may never lay at all; the second is that their first egg may prove their death; and, lastly, should they produce a few eggs, the chicks resulting will in all probability turn out such stunted little specimens as to be worthless. Breed from small cocks and fair-sized hens or pullets, feed judiciously, and you will secure chicks small enough for keenest competition.

Black-red Bantams.

The colour of Black-reds may thus be described. The face, head, lobes, and wattles in both sexes should be of a bright healthy red, with legs, feet, and beak of a rich olive or willow. Any tendency to slatiness shows Duckwing blood. The neck-hackle of the cock should be a bright golden orange, free from striping, and the saddle-hackle follows suit, only as a rule in the best specimens the saddle-hackle runs a trifle lighter, clearer, and richer golden hue than the neck. The back and wing-bow are a bright solid crimson; wing-butts black; wing-bars a glossy steel blue, free from rusty ticking; the secondaries of the wings a clear bright chestnut, which should run through to the end of the feather; breast, thighs, and tail a rich black, free from ticking, rustiness about hocks, or chestnut shaftiness in sickles, which generally denotes a pullet strain, and will tell slightly against an exhibition specimen.

The Black-red pullet should have a pale golden-coloured hackle, some shades lighter than that of the cock, each feather being very narrowly striped with black down either side of the shaft. The main body colour is somewhat difficult to describe. It resembles the medium brown drab shade of a partridge. If each feather be examined carefully, it will be found to be almost imperceptibly pencilled through with the finest black, yet so exquisitely fine as to produce one even soft shade of colour all over back and wings. Imperfect specimens often get this pencilling too much in evidence. Such are termed "coarse." Even in some of the best specimens there are two or three feathers, usually the top flight feathers of the wing, that show the undesirable blotching a little round the edge of the feather; but this is considered rather a serious fault in exhibition pullets. The breast may be described as a rich deep broken salmon, shading into lighter colour towards throat and thighs. The two top outer feathers of the tail correspond exactly with the colour of the body, otherwise the tail is black.

Breeding Black-red Bantams.

Now for the mating. See that the birds are sound in health: it is folly to hatch diseased chickens, because it is money and time thrown away. Do not crowd up the pen with a lot of pullets under the mistaken notion that you are going to produce a majority of pullets; or *vice versâ* if you have but few females to the male. This rule works far too inconstantly to justify confidence in it, and it is better to breed from three or four first-rate pullets rather than from a host of indifferent ones. By all means, if the breeder has funds and accommodation, let him mate up two pens, one for cockerel- and the other for pullet-breeding; although exhibition specimens of both sexes have been produced from one pen—*e.g.* the Crystal Palace Show of 1900, where the 1st prize Black-red cockerel and 1st prize pullet of Mr. Hugo Ainscough were from the same (pullet-breeding) pen. Such a mating is not a wise proceeding, and this is strongly borne out in the fact that the nice soft even shade of colour so much in evidence fifteen to twenty years ago has been lost, and nine out of every ten breeders of Black-red Game Bantams will tell you the same. We have certainly brightened the colour in cockerels, but at the expense of the loss of that beautiful soft shade in pullets.

The cockerel pen should contain as bright-coloured a male, cockerel preferred, as it is possible to command, with all exhibition points of shape and style, and especially neither duck-footed nor slip-winged, the latter being a rather common weakness. Place with him three tall reachy pullets or hens, extra stylish if possible, pullets preferred, prominent in shoulders and light in hackle to the crown of the head. Those foxy-coloured on wings, and a nice golden edge round the feathers of back and wings, are to be preferred. Some breeders use Wheatens to secure bright top-colour, which acts satisfactorily. Only, let the breeder beware that he never by any chance lets the produce get mixed up with that of the pullet-breeding pen, or there will be ruin, which years of care will hardly suffice to eradicate. If the chicks have to run together, see that they are marked from the first with dye, and afterwards, when old enough, rung. Personally, I prefer to use Black-reds only, finding that the produce is quite as satisfactory, and no irremediable result occurs should one or two break out of bounds and get mixed. The next year the best pullets from this pen could be mated to the sire, giving the older hens to the most suitable cockerel. In this way you maintain much more vigour than from mating brother and sister, and are gradually breeding back to the parents on both sides, whilst making a selection of the best each time from a show point of view. A strain may thus be built up and carried on for years without recourse to new blood. At any time the two lines are crossed the produce will contain exactly half and half of the blood of the original birds, as shown in detail in Chapter VI. Should the vigour of your stock decline from any reason, then it would be well to introduce a dash of fresh blood by going to some breeder who had originally the same strain as you started from. Otherwise you may find yourself at a point of delicacy beyond which it is impossible successfully to go. The one great and only drawback to breeding Black-reds is that they are so difficult to rear. The breeding of them as far as the very best goes has fallen to one breeder, who has in-bred so much that it is only with the utmost care that Black-red chicks can be reared. This experience is borne out by nearly every breeder of Black-reds.

The pullet-breeding pen should be put together on quite different lines. Each pullet or hen should be sound in colour, free from the objectionable coarseness on wing, deep in breast colour, and really as perfect types of show birds as it is possible to get. As a mate to these seek out a tall, stylish cockerel, but of a brickish top-colour, and of one even shade throughout from hackle to tail. He should be of a pure pullet strain, otherwise he is no good, and should possess all the requisites of a first-class show bird save colour. Both cockerel and pullets should be short in back, good in neck and limb, fine in tail, with good shoulder points, and a raven black wing-bar in the cockerel, free from any trace of lacing. The breast in cocks may show a little lacing, and such birds are often a little short in their bays, *i.e.* the bay does not go quite through to the end of the feather, a good sign if the bird be from true pullet-breeding blood. Do not put more than three or four pullets to an adult, especially early in the season, say February, or clear eggs will probably result. A cockerel may safely be trusted with twice that number.

Though it is advisable for a young beginner, if he can, to have two pens, it is proved by actual experience to be easily possible to breed winners, both cockerels and pullets, from the same pen, though perhaps not so large a percentage as from two different pens. I have done it again and again. My plan is to select a cockerel as near to an ideal pullet-breeder as possible, only, in this case, of a brighter top-colour, and mate with him two first-class cockerel-breeding pullets and two good show pullets. Such a pen will yield capital results, and answer the purpose well for those who are cramped for accommodation.

Pile Bantams.

Piles are treated of next because of their striking appearance, though amateurs will find them more difficult to breed than Black-reds or Duckwings. The Piles are also the counterpart of Black-reds, if we substitute white in the cockerels for black in the Black-reds, and a clear white in pullets for the partridge-brown of the Black-red pullets. They can for a certain length of time be bred solely from Piles; but it is found in practice that the colour "breeds out" after some five or six seasons, and it is necessary to resort to Black-red blood after a time. The exhibition standard is met in cockerels by a top-colour identical with that of the best coloured exhibition Black-red cockerels. Some judges prefer a deep claret back and saddle shading down to a golden orange; but I much prefer the former. The breast and bays are two very important features in the cockerels. There should be no lacing, or ticking, or smokiness in the former; whilst the bays should run right through the secondaries to the end, leaving no white or paleness, but one deep, rich chestnut. The eye should be kept as bright a red as possible—a more difficult task than in Black-reds. The pullets require to be free from foxiness on the wing, but, at the same time, the breast should be a rich salmon, and to get the two points in conjunction tries the utmost resources of the breeder. With the deep breast, as a rule, you get more or less rosiness or foxiness on wings, and with a paler breast you are more likely to secure clear colour on wing. Still, in these days of keen competition, a high-class bird, to be successful at our best shows, must excel in both points, and they can be obtained by patience and careful mating of pure pullet strains. Legs other than a rich orange are a most serious blemish. Years ago willow-legged Piles were successful in the prize lists, but those days are over, however good the bird may be in all other points. A rich deep orange leg is somewhat difficult to obtain, especially in certain parts of the country. After repeated experiments, I have fully satisfied myself that the maintenance of rich leg colour, when once obtained in a chick, is dependent in no small measure on the nature of the soil. Clay, good loam, and sand are helpful; limestone seems to fade and bleach the colouring matter considerably. A good, rich leg colour is indicative of a recent cross of Black-red blood, and when leg colouring begins to fail in any young chicks it is a sure proof that a cross is required.

Now let us see what can be bred respectively from the pure Piles, and also by a cross. In pure Pile breeding—*i.e.* where both parents are Piles—I will take cockerel production first. Your male bird must be A1, of the bright orange top-colour type. He will have some weakness, no doubt, but, above and beyond all else, do not let it be weakness of bays, or wing-ends, as they are sometimes termed. If these are faulty, pale in colour, and not carried one sound, rich chestnut from wing-bar to end of wing, you will never breed a good one; and, indeed, the bird may be considered almost a waster, both for exhibition and stock purposes, as he will not do for pullet-breeding either. Have no lacing or smokiness on breast or wing-bar if you can possibly avoid it, and if the eye is a bright ruby red, all the better. Now with this bird you want three or four tall, stylish pullets, short in back, good in limb, fine in tail, and with shoulder points well forward. If rosed on the wing all the better. Such a pen will give you plenty of rosy-winged, cockerel-breeding pullets, and rich, sound coloured, smart, reachy cockerels. Take every care of these pullets, as they are invaluable for cockerel-breeding, mated back to their sire.

Breeding Pile Bantams.

In pullet-breeding the great difficulty will be to find the pullets. Rich, deep breast we want, but above all clear wings, not wings that have had a few rosy feathers faked out of them for exhibition purposes—a trick practised by some, but easy of detection. The cock must be sound upon wing ends. Insistence upon this is as necessary as in cockerel breeding. Top colour is preferred quite uniform, of the dark type, a brick-red colour. Naturally the cockerels will be too light in colour for exhibition, but if pure in their white, and above all pure in their bays, they should be reserved for another season's breeding.

We next turn to Black-red-crossed Piles. For the cockerel pen secure a really sound coloured Black-red cockerel, tall and good in shape, and as perfect in colour as possible. See that he is sound in his black both on breast, bars, and fluff; he must show no trace of lacing whatever. Mate him to two or three lemon Piles, fairly clear on wing, seeing that they excel in shape and reach—this is most important—and have rich, deep orange-yellow legs. The cockerels will come yellow-legged, but three or four out of every half-dozen of the pullets will be willow-legged. The latter are generally the clearest in body colour and the hardest feathered, and more stylish than the orange-legged ones; but having dark legs are almost useless in the exhibition-pen. If judiciously mated to pure Pile pullet-breeding blood, they will often produce good coloured pullets. Some of the cockerels will be yellow-legged Black-reds. If sound in wing-bars and wing-butts, with a good, rather light, even top-colour throughout, such a one will, even though he be a bit laced on breast, tend to correct washiness in breasts of pullets.

But every one has not the space available for double mating. In this case a single pen can be made to answer very well. The Pile cock or cockerel should approach the ideal exhibition standard in every respect, and be of the light, bright kind of top-colour, but perfectly sound in wing-ends. Mate with him two rosy-winged pullets excelling in style and reach, with good prominent shoulder-points, and short in back. Also select two perfect-coloured pullets, with sound salmon breasts and clear on wing, with other points identical, the same as the other two. As stated for Black-reds, the percentage of *first-rate* ones, either cockerels or pullets, would probably be smaller; but there would be several available for successful second-rate competition. At the same time the breeder cannot expect, either way, to produce first- or even second-raters at the percentage he can in Black-reds. He will do very well if one in every half-dozen proves available for show purposes. This naturally forces up the price of a really first-class Pile, and ere this £50 has been obtained for a cockerel at one of the Liverpool exhibitions, and also at Kendal.

Piles have one great drawback. They want washing so frequently, especially if kept in a smoky district, and washing, if long persisted in, deteriorates the quality of the feather. There is, however, no alternative.

Duckwing Bantams.

Duckwings next demand attention. They are lovely coloured birds, more easily bred than Piles, and command fair sales at good prices. Up to the present only the Golden variety is tolerated in the show-pen in this country. The male is easily described. In every respect save top-colour and wing secondaries, which are white, he is coloured as a Black-red. He must have the same cherry-red face and appendages, including the most important factor—a red ear (not one trimmed up with scissors). In shape, style, reach, eye, and quality of feathering, he must be identical with the Black-red. Then for bright crimson on shoulders and back, substitute a deep straw colour, more or less shaded with maroon, which gives a very bright brassy look right across the back of the bird down to the tail, shading off to a creamy white on saddle, matched by the same colour on neck. The hackle feather both on neck and saddle should be as free from dark striping as possible. The secondaries of wings should be a clear white running right through to end of feather, and free from chocolate marking on the outer edge of the top feathers. A great many otherwise good birds fail here.

The pullet for exhibition is distinguished from the Black-red by the substitution of a lovely pale slate or steel-grey colour; this is exquisitely and finely pencilled over in the best specimens, but coarseness will show itself in indifferently bred birds, and the fatal blotchiness will in such also appear on wing-ends. Some strains will show a tendency to shaftiness of feather, which is also a defect. The back and wings should show a delightful softness and evenness of marking all over. The legs, as in the cock, should be willow. One of the most difficult points to secure in her is the deep salmon breast, with a soft, even body-colour of the lighter shade. With a light body-colour the breast is apt to run pale. If very pale, then it militates greatly against a show bird, but a fairly deep breast is no serious drawback.

Breeding Duckwings.

With regard to mating, cockerels are invariably produced from the Black-red cross, whilst pullets may be either pure Duckwing-bred, or, like the cockerels, be the result of a cross. To produce cockerels you require a typical Black-red cockerel, similar in every respect to the one described for Black-red cockerel production. He should be mated to smart, reachy, good-shouldered and short-bodied, pure Duckwing-bred pullets, with nice silvery-white hackles. These should produce excellent coloured Duckwing cockerels, but the majority of the pullets from this cross would be Black-reds, and these must not be allowed to mix with the pure Black-red pullets, or the result the following year to the Black-red pullet pen will be disastrous.

If these Duckwing-bred Black-red pullets are sound and even in colour, they can be mated back the following season to a silver Duckwing cockerel, with a view to the production of first-class exhibition pullets. The other way to breed pullets would be to mate up perfectly-coloured show pullets to a light-coloured Duckwing cockerel—pure Duckwing-bred on both sides. The silver Duckwing cockerel, useful as he is as a pullet breeder, is entirely at a discount in the show-pen.

Duckwing cockerels can also be produced from a deep rich top-coloured cockerel mated to Duckwing pullets; if they are a little ruddy and shafty on sides all the better. In mating up your pens, always look for shape in your pullets and colour in the cockerels.

The Brown-red is a very taking variety, but is not making much progress, and has never found so much favour as the three preceding. These birds are in too few hands, and suffer considerably by reason of their want of distribution. Pullets seem in advance of cockerels, and I have seen some lately which, for both type and style, could creditably show the best Black-red pullets the way. The chief fault at present is too much feather and a certain softness of feather, which seems incidental to the pale lemon colour. The little Brown-red lends itself very accommodatingly to the requirements of those who live in smoky and dusty places, and can be kept where a Pile would be smoked out. They are also easier to breed good than either Piles or Duckwings, and with a little management could easily be bred from one pen.

Brown-red Bantams.

Both sexes should have dark, mulberry-coloured faces, "gipsy" as it is termed, and the eye should be as dark as it is possible to get it. A light eye is indicative of a cross, as is also a red face, both serious faults in the show-pen. The legs and feet should be almost black. The neck and saddle hackle of the cock should be a light lemon colour, not orange, but more of a mustard colour, with the back and saddle a richer, deeper lemon; breast a black ground-colour, with a pale lemon lacing (sharp and well defined) round each feather, and extending well down to the thighs; wing-bars and secondaries black, free from all lacing, rust, etc., shoulder points black and free from lacing, tail green black. As a rule the feathering is neither so fine nor so short as in Black-reds, these points having been sacrificed to obtain the light top-colouring, which a few years ago was more of an orange tint than a deep lemon. Such a bird now would have no chance, even if harder in feather, so much does the lemon craze rule everything. In type, shape, and size, the Black-red ideal should be sought, though as yet some of the best Brown-reds are rather too large.

The exhibition hen should have a pale lemon neck hackle, with a very narrow stripe of black running down each side of the shaft. A most important item is that she should not be coppery capped. It is one of the great difficulties that engage the breeder's attention to secure the pale lemon lacing from crown of head downwards, as such birds are apt to be also laced on shoulders and back. The breast, as in the cock, should be exquisitely laced with pale lemon from the throat right down to the top of her thighs. The body, wing, and tail should be a glossy black; style, shape, and size as in Black-reds.

Breeding Brown-reds.

In mating up for cockerel-breeding, a first-class exhibition bird must be chosen as lord of the harem, with sharp, clear breast lacing, a beautiful lemon top and hackle, but free from lacing on his shoulder butts, which should be black; with a black eye and dark mulberry face, two very important items, and the style, shape, and size of an ideal Black-red. If mated to proper cockerel-breeding pullets, fine in breast-lacing, as pale as possible in neck hackle, with clear lemon caps, and the requisite points of limb, style, and shape, he is bound to produce good, bright lemon cockerels. Never mind if these mates are a bit laced on back and wings, all the better, even down to thighs and saddle. These are invaluable for the purpose in hand, and the best should again be chosen from the produce for next year's breeding. They are often such as money cannot buy, though in the show-pen they are useless.

To produce exhibition pullets you want a cockerel more of the orange shade of colour, a sort of second-rate show bird. He should be sharply defined in breast lacing right down to the thighs, but free from it elsewhere. There should be no patchiness of lacing on breast, and eye and face should be sound in colour. The pullets to go with him exactly follow the show type ideal, the lacing on breast being a pale lemon, sharp and well cut, taken well down to the thighs, and the neck hackle a pale lemon striped narrowly with black, and pure lemon capped, not coppery. The remaining colour should be a glossy black, free from lacing, rust, and shaftiness.

I am not much in favour of crossing with Birchen blood; but it has been done again and again to secure the pale lemon colour, as a Birchen is a cross between a Brown-red and a Duckwing. It must, however, always be at some expense of the mulberry face and dark eye. Where the top-colour is running too dark, and lighter birds are out of reach, the only remedy appears to be to use a Birchen, with as silvery white top-colour as possible, and put him to three or four well-laced pullets, in this case not necessarily so pale in their lacing as those required for cockerel-breeding with a Brown-red. In all these arrangements, if a cock be used, put with him pullets, and if a cockerel put hens. Grand light lemon-coloured exhibition cockerels should result, if you can keep the dark gipsy face and black eye. One of these cockerels should be mated up with the same hens the next season, whilst another might be put to the best-coloured and tallest pullets, with darkest faces and eyes. You would still retain the desired colour, and at the same time be getting depth of colour in face and eye. There would be some

Birchens among the produce of the first cross, which could be returned to the father for pure Birchen breeding, as it would be unwise to use him again with his Brown-red progeny, or next season more Birchens than Brown-reds would result.

Birchen Bantams.

Birchens to-day are more popular than they ever were, but still not more so than I should like to see, for really there is no prettier or more taking bird than a good Birchen pullet. As already stated, they came originally by crossing Duckwings with Brown-reds, but now it would seem preferable to breed them as much as possible *inter se*, so as to get the proper mulberry face and deeply coloured eye emphasised as much as possible. The male bird is easily described, as he resembles the Brown-red in every point save top-colour and lacing on breast, which should in both cases be a pure silvery white. As there is Duckwing blood, the greatest care should be exercised to eliminate the tendency to red face and eye resulting from a cross with a "red-faced" variety. The pullet also resembles the Brown-red in every point, if we substitute white lacing of the breast and neck hackle for the pale lemon of the Brown-red. Naturally there will be some tendency to lemon hue in the neck. This should be rigorously suppressed, and is more in evidence in cross-bred than in pure-bred birds. Another serious fault with many pullets is a dark cap instead of a uniform silvery white from crown to end of hackle; and even some of the most typical birds hitherto have failed in sparsity of lacing on breast. The difficulty is, when the breeder has secured the lacing from throat to top of thighs, to prevent it appearing elsewhere, as on back and wing, with shafty feathering, which would condemn a bird much more than the want of enough lacing on breast, though such birds would prove gems in the cockerel-breeding pen. Of course the eye will give trouble; it is only to be expected. Red eyes should be rigorously eliminated; though we often see birds with this defect winning, it ought not to be so. A deep brown or black eye is the correct thing, though it seems next to impossible to get them as coal black as in Brown-reds, owing to the Duckwing cross in them.

The mating up presents no difficulty. The same lines should be followed as with Brown-reds. It is preferable to breed from pure Birchens, but if unable to procure these, one must begin at the beginning, and procure two or three typical Brown-red hens or pullets heavily laced on breast, and mate them to a Silver Duckwing cockerel of good quality. Birds of the right stamp can be easily compassed for about a sovereign or under from any reliable Duckwing breeder, as they are of no use in the show-pen.

White Game Bantams.

Whites, I think, will never secure the popularity in this country that they do in the States. They are mostly sports from Brown-reds, though doubtless some are bred from lemon Piles, and for some time will show traces of their origin in the sulphury hue of the neck hackle. Pile breeders look upon lemon Piles as rank wasters, although in America classes are provided for them. Therefore it is an easy matter to pick up birds at from 5s. to 10s. each about August or September, so that anyone who fancies this pretty variety—for they are pretty—could set up very decently for a matter of 30s. or so, and some day the popular taste might change. The Pile-bred Whites have the advantage over the Brown-red sports in that the latter are often willow-legged. A good White should have either rich orange-yellow legs or white legs to set him off to the best advantage, and be a pure paper-white all over in both sexes, with brilliant cherry-coloured faces and ear-lobes; eyes red. Do not attempt this pretty variety unless you can give them a country atmosphere, free from smoke and dust, and where they can have a free grass run. Otherwise disappointment will ensue.

OLD ENGLISH GAME BANTAMS.

Old English Game Bantams.

After lying for years in a dormant state the fancy for Old English Game Bantams suddenly leaped at a bound into amazing activity. The breed was as old as the hills, but had been much overlooked since poultry shows came into fashion. I remember having a fine pair when I was a boy of some ten summers, over forty years ago. They were of the "spangled," or, as it was then termed, the "speckled" variety, and handsome birds they were, though perhaps a little larger than those which would nowadays grace a show-pen. But they were by no means new then, for my grandfather kept them in his day, and the probability is that his forefathers some generations back had them too. Latterly they have come with a rush again, and no committee need fear that their classes will not be filled with this breed. And as to prices, what might have been purchased a little while ago for a shilling, and picked up in a backyard, compasses now a couple of £5 notes.

The varieties of Old English Bantams, like those of Old English Game, are legion, but in my estimation the palm for beauty must go to the Spangles, followed by the Black-reds. In no way are the dwarfs inferior in pluck and defiant attitude. I feel sure that they will live long and see good days, which they well deserve. They are extremely hardy and healthy, easy to rear as chicks, and may be kept in exposed situations where the Modern Game Bantam would perish, whilst to-day, in 1911, they are certainly more popular than Modern Game Bantams.

I will now try to describe what in my opinion an ideal Old English Game Bantam should be. Head medium length, but thicker than the Modern Game Bantam; face bright red, with a red, fiery, defiant eye, strong, slightly curved beak, comb small, of fine texture and single, wattles and ear-lobes a bright healthy red, the latter without a trace of white. Neck-hackle plentiful, coming down well on to the shoulders, and covering a fairly long neck, set well between a pair of broad, prominent shoulders, and above a full, broad, deep chest. Back broad and short, stern fine, giving the body a wedge-like look, wings short, well tucked into the side, but full, so as to avoid any appearance of being "flat-sided," which is a serious defect. Legs short and thighs muscular, well set apart, shanks medium length and round in front, not flat. The legs should be white or yellow in the before-mentioned Spangled variety, but white for preference, toes long, straight, and muscular, with no signs of being duck-footed. Carriage bold, sprightly, defiant and independent. The tail should be the complete antithesis of that of a Modern Game. The square, or hen tail as it is sometimes termed, is longer and broader in webbing, whilst the sickles are broad, a good length and nicely bowed, with four or five good side hangers on either side placed so as to well clothe the tail proper. The bird when in hand should feel corky and yet hard.

The points of colour in Black-reds are exactly those of a good Modern Black-red, with beak to match the legs. The tail, and also flight feathers, sometimes runs into white, which is to some extent a defect, but only a slight one, in the exhibition-pen. The pullet is either of the partridge or wheaten type, broad in front, short in back, with short, muscular legs and a full tail. The partridge colour has been fully described already, under the Modern Black-red Bantam hens. The Wheaten is a beautiful bird, with a bright golden hackle, with narrow dark striping down each side of the shaft. Her breast and thighs are a pale fawn colour, whilst the top colour, together with the two top outer feathers of her tail, is that of red wheat, hence the name. The tail proper is black.

The colour in Spangles is very beautiful, both sexes in this respect being identical. Heads cherry red, as in Black-reds, plumage throughout black, red, or blue, evenly spangled all over with white, tail black and white, legs white or yellow.

The cocks run from 14 ozs. to 20 ozs., whilst hens are from 12 ozs. to 18 ozs.

Breeding Old English Game Bantams.

Black-red cocks may be Wheaten-bred or pure. If from Wheatens, the colour is not so bright, strange to say, as from partridge, if the cock be partridge-bred too. The brightest golden-coloured cocks, partridge-bred, are much brighter than the brightest from Wheatens, and are generally a sounder black on breast. The partridge hens must, of course, be bred from pure partridge-bred birds on both sides, with no admixture of Wheaten blood whatever, and the same lines should be followed exactly as recommended for the production of the Modern Black-red. To successfully breed Wheatens we want Wheaten blood on both sides, a Black-red Wheaten-bred cock with Wheaten hens or pullets, and this cock should be much darker in top colour than the exhibition cock, and be pure Wheaten-bred.

The best Spangles seem to be produced from parents evenly spangled on both sides. Should the produce, however, run too light, use a partridge hen, as producing a rather more pleasing shade than a Wheaten, and harder quality of feather. My choice, however, would be to breed from evenly spangled birds rather than resort to this cross.

Blue Duns require a word or two, though no very precise lines can be taken for their production, as they may come from Black-red cocks and blue hens, or a blue-red cock and a Wheaten hen, all being very sound in colour to begin with. Probably a good blue hen could be bred from the latter, as well as from pure blues on both sides. The fact is they can be bred many ways, and it hardly matters how, as, if proper type, shape, and size be secured, colour in an Old English Game fowl of any kind is quite a secondary consideration, with the exception of Black-reds. What must not be, is any attempt to foist upon the judge a thick heavy waster of the Modern type, as an Old English Game Bantam. It has been tried, and in some cases with success, but new century requirements are much ahead of the last couple of years of the last century, and as there are now hundreds of the genuine thing in the land, there is really no necessity to try such deception, which would be now instantly detected by a good judge.

The following are the Standards for judging Modern and Old English Game Bantams. Their colours and other characteristics being the same as in the larger breeds, it has only been found necessary to give the proper weights and scales of points:

MODERN GAME BANTAMS.

Weight.—As a cockerel not more than 18 ozs., nor 20 ozs. as a cock. Hen, 18 ozs. Pullet, 16 ozs.

VALUE OF POINTS.

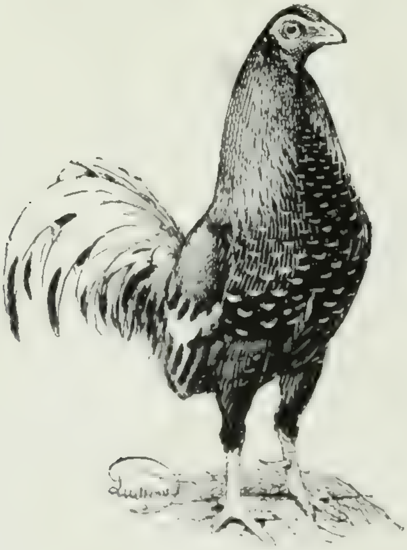
Defects.	Deduct up to
Defects in head and neck	10
Bad eyes	8
Defects in body and wings	7
„ legs and feet	12
„ tail	10
Want of symmetry	10
„ condition	10
Bad colour of feather	15
Too much feather	8
Defects in size	10
A perfect bird to count	100

OLD ENGLISH GAME BANTAMS.

Weight.—Cock, 18 ozs. to 22 ozs. Hen, 16 ozs. to 20 ozs.

VALUE OF POINTS.

Defects.	Deduct up to
Defects in head and neck	10
„ eyes	8
„ body and wings	15
„ legs and feet	12
„ tail	7
Want of symmetry	10
„ condition	10
Defects in colour	10
Too much feather	8
Defects in size	10
A perfect bird to count	100



Old English Game Bantam.

CHAPTER XXXV.

THE "VARIETY" BANTAMS.

WE now come to another section of the Bantam fancy, and there can be little question what breed should stand at its head. So long as it lasts Game Bantams will probably reign supreme, but the beautiful Rosecombs must, I think, come next, standing as they do without a rival amongst "variety" Bantams. This being so, I must, at the outset, regretfully warn my readers, even at the risk of offending some of them, that this breed lends itself but too freely to the arts of faking, inheriting this defect from its ancestors the Hamburghs, than which there are no birds living more "manufactured" for the show-pen. Giant strides have been made in really breeding up to the ideal standards; but nevertheless it will not be overstepping the mark if I say that 25 per cent. of the Rosecombs exhibited at present are manufactured rather than bred. This is a large percentage, and I admit it in the hope that the reprehensible practice may be stopped, and both exhibitors and judges be put upon their guard against a real danger. For nothing kills a breed sooner than this kind of thing. If the novice or real amateur is the back-bone of the fancy, then to get the upper hand of him constantly through proficiency in art, and not in science, is to smother his enthusiasm, as well as trample on his exchequer, and it is earnestly to be desired that the Variety Bantam Club, or the Poultry Club, or both, will use all their influence to put down this pernicious evil.

Black Rosecomb Bantams.

Black Rosecombs are fairly hardy if not too greatly in-bred. The chicks, however, often require special care for the first few weeks of their lives, after which they forge ahead, and are able to stand a decent share of knocking about at shows, and indifferent weather. They are capital layers, but a cold, heavy, clayey soil is against them. A dry, sandy, and somewhat shady locality is the best.

We want a rose comb fitting close to the head, fine in points, full of work, bright coral in colour, and finished off with a long, fine, round leader or spike behind. See that the comb is square and full up in front, with no valley down the centre, or leafy in front, both bad defects. The face must be a bright cherry red, entirely free from white, which often shows its approach by a tiny white speck under the eye or round and under the white deaf-ear. This deaf-ear or lobe must be round, thick, large, and white, of smooth, kid-glove-like texture. The wattles are bright red and well rounded; eyes dark and full; head short and fairly broad, with dark beak, slightly curved; neck short and thick, and heavy in feather, spreading well over shoulders; back short and broad; wings not too long, but fairly large, and carried rather low; tail as full of broad feather as possible, both in the tail proper and in the hangers and sickles, which cannot well be too long or too broad, or too many in number. The bird throughout requires the most ample flow of feather, and the carriage is jaunty and important. Legs and toes black, short, and fine, with either white or black nails. Breast broad and prominent, carried somewhat Fantail fashion, with head well thrown back. In adult and old birds the legs will often be found slate or pale coloured. The total weight should be from 14 ozs. to 18 ozs, and in Blacks the green sheen should be one of the characteristic beauties of the bird.

The hen should have the same red face, comb, and wattles as the cock, only the two latter should be much smaller than in the male. See that the comb is not flabby, loose, and coarse. The ear-lobes must be rather large, with beautiful texture. The breast is full, broad, and prominent, as in the cock. The back should be extra short; tail full, and carried rather gaily; whilst legs are short and dark. The whole carriage of the hen is strutty and important. The wings may be fairly long and drooping as in the cock, and as much sheen on her raven feathers as possible should be secured.

In the breeding of Rosecombs, the first great care to be taken is to get a good, reliable strain; and when it has been got, stick to it. Do not go chopping about here and there, and mixing up everybody's strain with your own, or you will greatly regret it some day in the extra size and coarse quality obtained by such a thoughtless system of breeding. Keep therefore your own blood, as pure as possible, watching the health of your chicks, and letting that regulate your actions. You cannot, of course, go on for ever without some new blood, but when you are driven to get a little extra stamina into your stock, see that you go to the right place; that is, to the same yard whence yours originally came, or mainly derived from it. If this cannot be done, then get hold of a bird or two with at least a dash of the same blood as your own. Then you will be able to keep size down, whilst maintaining a fair amount of constitution.

Select the cock as near to the ideal as possible. Do not be tempted to use a coarse, clumsy-headed bird, or one scant of feather, as it is only time and money thrown away. As your stock birds are, so will the produce be. Mate him to a few short backed, neat headed, clear lobed, coral faced, jaunty hens. Get them as good a colour as you can, not too big, free from any trace of white in face, dark in eye, and full in tail. If the two top feathers of the tail be broad, and curved a little, all the better. From such a pen you should get some cockerels worth looking at. It is quite possible to breed really good birds of both sexes from one pen, but if you have room, time, and purse long enough, set up another pen for pullets, as the male bird is better if he possesses some red or bronze feathers in back and saddle. It is a singular thing that nowhere do we see a quantity of any colour without what is called its complementary colour. That to beetle green is red, and as we want as much deep beetle green as possible in the pullets, the more red there is in the plumage of the sire, somehow the more green there will be in the plumage of the daughters. In all other ways the breeding-pen for pullets should resemble that for cocks, provided always that the pullets are the best procurable, exhibition birds, and approaching the Standard as closely as they possibly can. Then you need have no fear. Only take care in the rearing. Remember that soft food, as a rule, produces feather, whilst grain is conducive to hard and scanty plumage.

White Rosecombs.

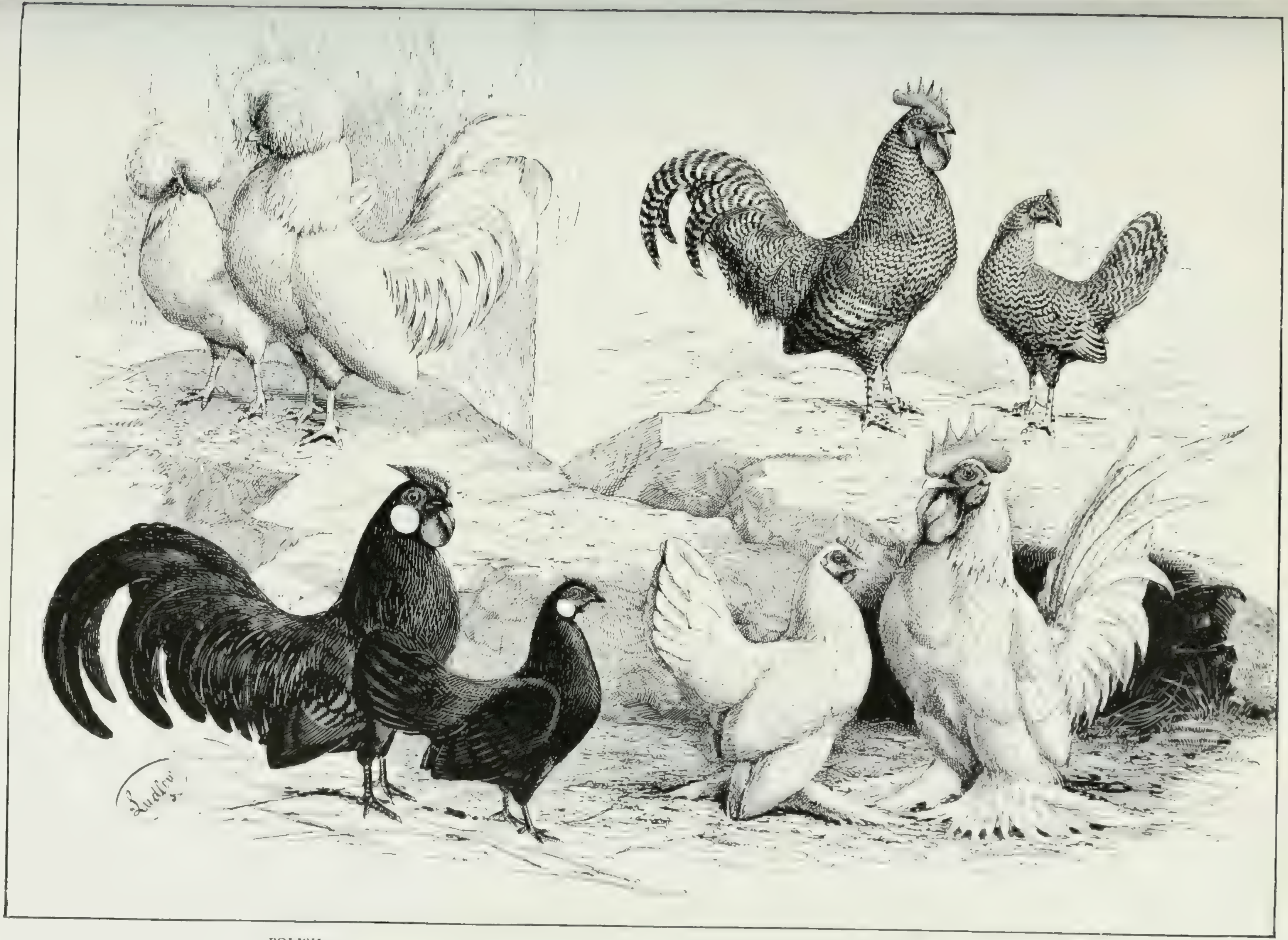
Now for Whites. They are hardly what they once were, and improvement during the past few years has been very slight indeed, and yet they are extremely handsome birds. They are doubtless less popular because of the ablutions necessary before exhibition, for it is folly to expect an unwashed bird of any white variety to win. Again, beautiful as they are, they require protection from sun and weather. The plumage should be a pure white, free from all lemon or straw tinge, and this is not easy to maintain where there is not adequate shelter. Still it can be done almost everywhere, with a little pains and forethought; and as the breed makes a most lovely exhibit at the shows, it is well worth taking up and persevering with.

Beyond the colour, it is identical with its black brethren. It can either be bred pure, or from Black cock and White hens. The produce will come self-coloured throughout, black or white; no mottles, cuckoos, greys, etc., but either Black Rosecombs or White. If a Black cock be used, his legs must be a shade or two paler or more slaty than for breeding Blacks. The White chickens will in all probability show a little duskiness in the legs and feet *the first season*, but a little judicious selection the following year would remedy this, and a good plan to follow is to put the White pullets to a good, long-feathered White cock, and the old White hens to the best of the White cockerels. By doing this you will greatly improve the lobe and length of feather.

Sebright Bantams.

In the Sebright or Laced Bantam we have another most beautiful variety. If the ladies cannot take to the Sebrights I shall lose all faith in them (the ladies I mean, not the Sebrights). The birds are prime favourites at shows, and invariably attract a lot of attention, both from their style and carriage, and also their beautiful lacing, which in good specimens is almost perfect. This breed is no new manufacture, dating from the days of Sir John Sebright, who worked with it indefatigably, and got together a host of enthusiastic friends who took it up, and had special delight in competing with one another in their frequent exhibitions. It matters little how it was derived, but it probably was of Polish descent, differing from the larger laced fowl in absence of crest, and of sickles in tail.

There are two varieties, Silvers and Golds, but at the present time Silvers are by far the more popular, probably from the fact that the contrast is greater in them, and in consequence more catching to the eye, and also that they are much easier to breed true to colour. In both varieties it is not so much the lacing that is difficult to get, as the quality of it. We often see it a dusky, rusty colour, instead of a good beetle black, and especially so in the Golds. It requires much care in this case to get a good rich ground colour, combined with the necessary quality of glossy black, at the same time maintaining an absolutely clear as well as rich ground. Often the Golds run far too pale in ground-colour, which again is a serious fault. This can however to a certain extent be remedied by colour feeding.



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POLISH.
BLACK ROSE-COMBED.

BANTAMS.

SCOTCH GREY.
WHITE BOOTED.

Sebrights require some management to secure fertility in the eggs. The evil of infertility is one which cannot be remedied quite so easily in their case as in Pekins and Booted, since it is the natural result of breeding from hen-feathered cocks. Still much can be done by absolute rest from exhibition during the breeding season, and by choosing those male birds which actually do chance to come sickled, or have at least an inch or two of sickles projecting beyond the tail proper. There is nearly always an abundance of eggs from a well kept and housed pen of Sebrights, so this helps the breeder. But the little chicks are delicate, especially during the first few weeks of their lives, and require quite professional care to rear them. They should have dry, very dry sheltered runs, and be absolutely cut off from cold east winds and beating rain, with access to as much green food as possible. Some breeders from long experience are very successful. Their percentage of clear eggs is small, their run of luck with chicks good, and their fortune in the show-pen excellent. But such breeders are observant. They do not overtax their breeding-pen in any way, they shelter it and look well after it, and the young broods have their individual attention. Others, on the contrary, make very little out of a pen. They cannot be convinced till it is too late, that care and thought are necessary. They have perhaps reared Brahmas, Cochins, Orpingtons, and the like; they "know all about it," they say, and failure after failure does not make them much wiser.

In describing what a typical Sebright should be, I will take Silvers first. I like to see in the cocks a short square back, perfectly flat, breast full and prominent, wings carried somewhat low, and tail somewhat up, giving to the little fellow a very proud, strutting, jaunty air. The comb should be helmet-shaped, fairly broad in front, full of work, and with fine leader curved towards the neck. The face should be inclined to mulberry. The cockerels can never be got as deep a colour in face as the pullets; still, the deeper the better. They should always have a certain amount of dusky crimson about the eye. The ear-lobes should be free from white, but a little purple or blue is an advantage. The eyes are very dark, beak horn colour, short and stout, wattles fair size and nicely rounded, not folded or creased. They should be clean legged, of a slaty-blue colour. The tail should be fairly large, and well spread, quite hen-feathered, with no sickles or side-hangers as in other rosecombs. Occasionally a sickled bird will come, and such if good in all other points will make a capital breeder, as a much larger percentage of chicks will be produced from such a bird, than from the somewhat unprolific hen-tails. Head and tail should nearly meet in a bird of excellent carriage. The plumage should be a clear silvery white in the ground, with a clear, sharp, beetle-green black, but fine lacing. Some lacing fails by reason of it being a sort of brownish-black, or in some strains grey-edged round the black. In others the lacing may fail by reason of its disappearance at the extreme end of the feather, whilst some again is spoilt by reason of the increased width of the lacing at the end of the feather, which is doubtless a tendency after the Polish or spangled form of marking. This defect is principally seen in the larger feathers of the tail. See that the secondaries of the wing are well laced right down to the lowest feather. Often two or three feathers here fail. The tail coverts should also be well examined. They should be numerous, and well and sharply laced. There should be no spotting or smuts, or dusky appearance in the root of the large tail feathers. Such feathers are said to be cloudy or peppery, and are a most serious blemish. This fault however can be found in at least 50 per cent. of Silvers. It will doubtless be bred out with time and patience, and so the greatest care should be taken that foul-feathered birds are not admitted into the breeding pen. The Silver hen is identical in ground-colour and lacing with the cock, also in shape. She is however much darker in face than her mate, and of course she is smaller all through, and with a neater and finer head. Long-backed pullets are a mistake. See that your birds excel in short square backs, as well as in colour, marking, and carriage.

The only difference between the Golds and Silvers lies in the ground-colour. The former should be a bright rich deep golden-bay or chestnut, not the pale golden we often find in the present day exhibits; which get unfortunately lighter and lighter, till eventually they will probably approach a pale buff. Such birds, too, generally have that rusty-black lacing, than which nothing can be more objectionable. They are also liable to fail altogether in the lacing of the flight or secondary wing-feathers, and such are in these days of keen competition worthless in the show-pen.

In breeding Sebrights a little discretion is necessary. It is invariably found that a heavily laced bird bred to a lightly laced one, will produce a greater percentage, and a better quality of lacing, than if two good quality medium-laced were mated together. But yet another rule obtains, that the heavily-laced bird should be of the same sex as you wish to produce good specimens of. You wish to breed cocks, say. Put your pen together thus: heavily-marked cockerel, beetle-green laced, good dark face and orderly comb; and to him two or three good shaped, but lightly laced pullets. Be sure and have shape in the hens, and perfect colour and markings in the cock. In pullet-breeding use a lightly laced cockerel, with pullets a trifle too heavily laced for the show-pen. See that every bird in both pens is laced to the wing-end. Have no failures there, or on breast or tail coverts, and use no rusty lacing in the production of your stock. See that every feather is clean from smut, splash, or other "ground" defect. As a pullet-breeder, a cock with sickles or any tendency thereto is much to be preferred, by reason of his greater fertility. In pullet-breeding you want a good amount of heavy lacing down the thighs, tail coverts, and tail. This is very important. For both cockerel and pullet pens invariably select a small cock rather than small hens. I say hens, for they are always preferable in a Sebright pen to pullets, by reason of the delicacy of the chicks. A pullet has not come to maturity, and hence has not gained her full strength; though if she be very forward and well grown and in good health generally, there is no reason why such a one should not be tried with the hens.

In concluding the consideration of Sebrights, I must yet once again urge the necessity for in-breeding, and also keeping to one strain. It plays havoc with all breeding to go mixing strains promiscuously. If you want to do well, then purchase a first-rate breeding pen from some well-known and established breeding strain. Get the birds as above described with a specific object in view, and stick to that strain, certainly until you have reached the limit of its breeding powers, and never be driven, so long as you can rear chicks fairly easily, to go in for new blood. A time does come when a change *must* be made, but it is a time of *crisis* with the breeder, and he may undo more in a single season, by an injudicious cross, than he may be able to set right again possibly in the next ten years. Go for new blood to as near your own as you possibly can. Get a cock that has come from the same strain as your own, and you will be able to go on again as successfully as before.

Pekin Bantams.

No breed of Bantams has made more progress of late than the Pekins, named from the city whence came the first pair of Buffs in 1860, small birds certainly, but wanting in many of the show points of to-day. At the present time the subdivisions of the variety are legion. We have now Buffs, Blacks, Whites, Cuckoos, Partridges, and Mottles; a grand array with many admirers, a Club to themselves, and presenting no trifling competition to breeders or exhibitors of other varieties. So great is their excellence, that if we except the very best specimens of Buff Cochins, the Pekins excel all other varieties of their larger congeners. As a proof of their immense popularity, at Liverpool show in 1899 there were exhibited in one class thirty-eight specimens of Buff Pekins, whereas the Rosecombs, with two classes, only mustered thirty-nine entries; and while the cup for the best variety Bantam cock was taken by a Black Rosecomb, a fine fellow too, that for the best variety hen fell to a Black Pekin, which, like the Rosecomb cockerel, was deemed as near perfection as it was possible to attain.

Pekins can be kept almost anywhere, if they can be liberally supplied with fine sand, chaff, or peat moss dust to keep the foot-feather unbroken and in good order. Use this liberally both in pen, and in the sleeping quarters: it is the only way to preserve the foot-feather in decent trim, and this feathering is so important in the show-pen, that too much care cannot be exercised. They are capital layers of tinted eggs, and they come on to lay early in the year, so that by the time the breeding-season is over, there is generally a good supply of eggs, both for incubating and for sale. The chicks are very easily reared, and thrive under circumstances trying to other varieties. As with all other feathered-legged breeds, a little scheming is necessary for the production of fertile eggs; but if the feathers on the feet of the cock be cut short, and also those around the vent of the hens, no difficulty is found on this score. It will therefore be seen that one ought not to use exhibition birds as stock birds, and the great breeders and exhibitors employ proper stock-birds apart from their show specimens. It is a wise precaution, and procures stamina and health in the offspring. The Pekin hen is a capital sitter and mother. Though she will lay a decent number of eggs in a season, yet she will have an incubating turn after every dozen eggs or so. This fact, added to the feathered feet, constitute the only two real difficulties in keeping Pekins. If the Pekin hen be crossed with a Silky cock, they produce the very best sitters for Bantams that can be produced, which cannot be equalled either as sitters and mothers for Bantam chicks. No wonder Pekins are such favourites, when wasters in pullets will readily fetch 4s. to 5s. each from January to April as broody hens.

Pekins do not lend themselves to the faker's art to anything like the same extent as Rose-combs; still the tail very often attracts his attention, and goes into a premature moult. It is time that this kind of thing was wholly and entirely rooted out. It is nothing less than fraud, and it is probable that before long, exhibitors will be found so determined to put down faking as to bring a criminal action for attempt to obtain money by false pretences. The Pekin faker has often been let off by judges who would, in regard to Game Bantams, never dream of abetting fraudulent practices, and they ought to be consistent.

In describing the general characteristics of the Pekin, we must remember that he is intended to be an ideal Cochin in miniature, in everything except size. Commencing with the head, we want a comb single, finely serrated, and as small as possible, although it is almost an impossibility to breed it in Pekins so small as the full-sized Cochin; red eyes, red ears, face, and wattles, with short curved beak, and the face as smooth as possible, free from all coarseness, the neck short and thick, chest broad and carried well forward, back short and broad, with nicely rounded full cushion, and abundant feathering on short legs, right down to the end of the middle toe. The cock's tail should be composed of soft feathers, softer than those of any other breed of Bantam. The feathers of the tail proper are twelve in number, and the hangers are abundant, corresponding in colour with that of the body. There are no long sickles, the tail rising gradually from the back. The body is extremely low on the ground, almost touching it in fact, and though abundant feather is required on the legs, yet it is a great defect in Pekins if they are "vulture-hocked." The colour of the legs in all varieties should be a rich yellow, the richer the better. It was no easy matter getting this colour in Blacks, but it has been done; and willow or green legs should count heavily against a bird. The *bête-noir* of Pekins is scaly legs; but where proper care is taken, and an abundance of sand provided in the pens, it rarely occurs.

Buff Pekins.

Buffs and Blacks formerly took the lead, but the former have certainly lost in popularity owing to the introduction of colour feeding by some exhibitors; and in 1911 the most popular is the White. The exhibition Buff cock should be a rich, even, dark orange yellow, *not red*, one uniform shade throughout, the word "throughout" including the tail, and the extended wing, when primaries and secondaries are opened out. Many a bird looks well in the pen till we come to the secrets hidden under the external side of the wing, or probe down amongst the bunch of soft tail feathers. Then the solid buff is often found to have given place to white, or dusky colour, or perhaps feathers are wanting where these defects are usually found. Any bird whose colour is thus unsound, ought under no circumstances to be bred from, as such a fault has a tendency to perpetuate itself in the progeny. The hen to match should be a rich golden buff, just a shade lighter than the cock. The happy medium will be found between being too pale or too deep, if she match the breast colour of the cock.

In mating Buffs, see that the hen is very even throughout, a rich level buff everywhere, free from all smutty, white, or peppery feathers. and a perfect little Cochin all through. If she be as she should be, you may with confidence turn up the feathers on her anywhere with the hand, and you will find them buff right down to the skin, and if you spread out her wing, or examine her tail, she will be sound. See that she has no tendency to mealiness, *i.e.* to run lighter in the centre or edge than the rest of the feather. This is an important point, and one that is keenly looked after by breeders and judges. The colour cannot be pronounced perfect unless she is one same rich even tone of colour all through, from head to tail. She should be mated to a cock of the darker shade; not of course to one of the deep red, or cinnamon colour, but one with distinctly pronounced golden buff, strong in colour, without in consequence suffering from greater depth of tone. Under no circumstances must he be on the light side, nor yet have smutty or white under-fluff. It is only the rich coloured birds, solid in the buff down to the skin, that can be confidently relied upon to produce really first-class stock, as in all other varieties of Buff fowls. For this reason it is absolutely necessary that in judging Buffs every bird should be handled before the verdict is given.

For a breeding-pen we generally like from four to six hens to a cock, and not more. Hatching can be carried on with advantage down to the end of July, but no Pekin arrives at perfection until about twelve months old, in which point they differ from most other breeds of Bantams. This has its advantages, as well as its disadvantages. By late hatching size can be kept down, and length of leg reduced, both important features in Pekins; and though length of foot-feather may possibly be a little curtailed, still I think the advantages of late breeding outweigh the disadvantages.

Black Pekins.

Now we will proceed to Blacks. Most readers will be familiar with the rich beetle green of the Black Hamburgh plumage. I cannot say that such has yet been obtained in all its lustre, but that is what we want to aim at. This colour in Blacks is a great desideratum, and when obtained, counts very heavily in their favour. The fluff should also be black right through down to the skin. Much oftener we find it a grizzly grey, or almost white, arising no doubt from crossing of the Black variety with Whites for the sake of stamina, and obtaining length of feather; but all the same this defective fluff is a great blemish, and every care should be taken to eradicate it. Breed as long as you can from Blacks pure and simple, only crossing with White under compulsion.

Blacks can be bred from one pen, though we prefer two, for the simple reason that the rich beetle green of the pullets is best got from a cock showing a tendency to ruddiness or bronze, which would never do, of course, in cock-breeding. The cock for that must be the best coloured exhibition specimen obtainable, rich and lustrous, but red feathers would be fatal to him in the prize pen. But such red-feathered cocks are just what you want for pullet-breeding, *i.e.* birds with a tinge of red in the saddle and back. Select in both breeding-pens, birds as short in back as possible, low on the leg, good in feather, and with as small and neat combs as possible, and then you will not go far wrong. See that the *middle* toe especially is clothed with feather to the nail, and that there is no admixture of white in foot-feather, tail, or under wing feathers. Do not have hens tinged with any foreign colour, in either cockerel or pullet-breeding pens. They should be quite pure, very sheeny, and as near exhibition specimens as can be obtained. Discard grey or white in fluff or lobe.

White Pekins.

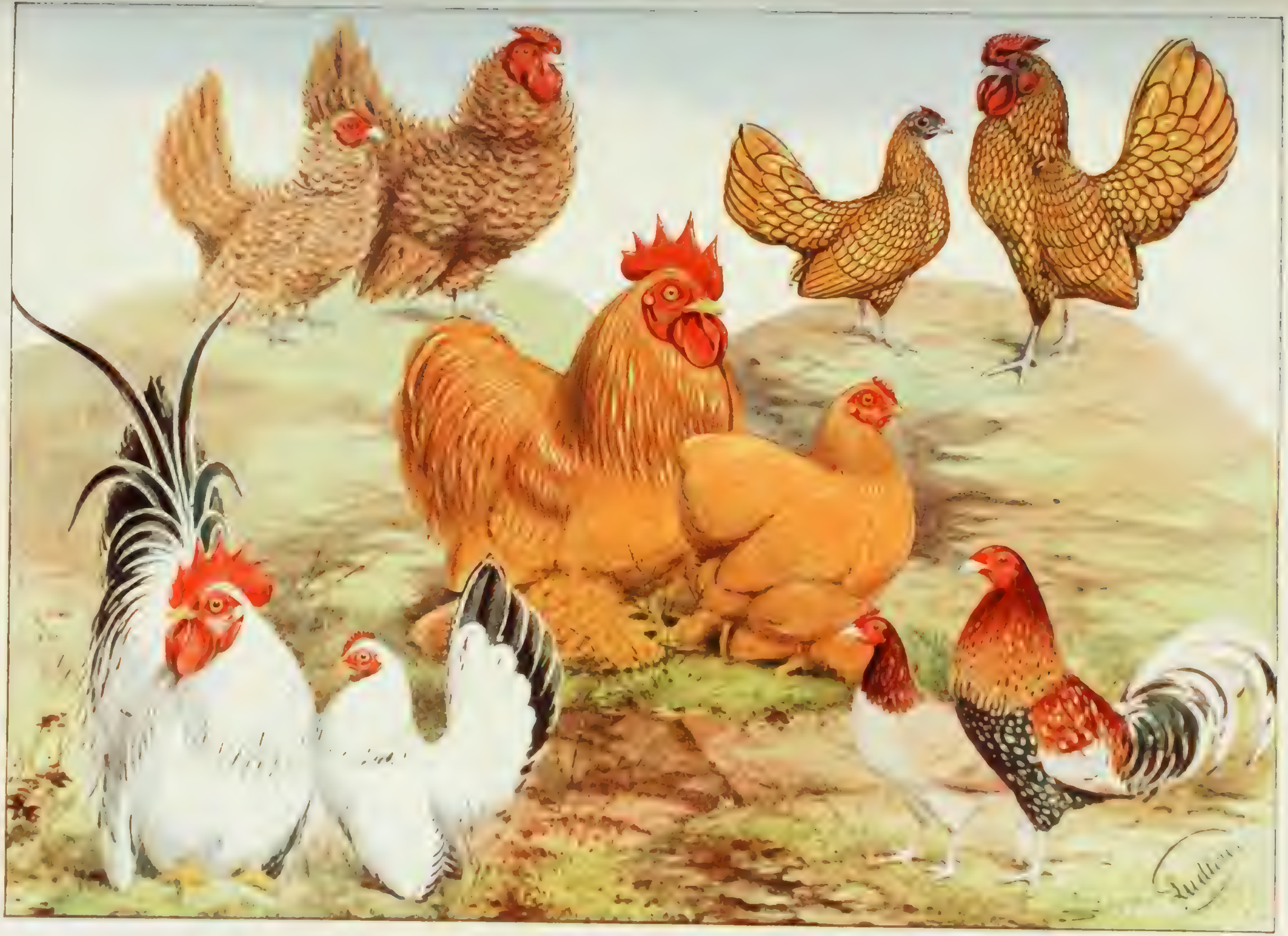
White Pekins are a charming variety, only they must be white quite free from any straw tinge, and very rich in orange leg-colour. They are not quite so easy to keep as some of the other varieties for these reasons. They must have a grass run, partly covered and boarded up at sides; in fact as much protection from wind, sun, and rain as can well be given them, compatible with their health. They do well on a dry sandy run by the seaside, and are all the better so far as leg colouring goes, if kept out of a limestone neighbourhood. They are extremely beautiful in the show pen, and are abundantly feathered in the best specimens. Of course they have to go through the tub, like all white birds, before exhibition, but they soon get used to it, and are unusually tame under the operation, after they once understand it. Small woods or orchards are capital places for them; but never try them in a backyard, or smoky place; or where there is much grit and coarse matter to injure the foot-feather. They are very easy to breed true to colour, if you get the right blood for a start. Any tendency to a rich creamy colour is against them.

They may be crossed with Black occasionally to keep up their strength. The produce will be black or white. The Blacks will show the cross by grey under-colour, and possibly in chickenhood a few white feathers in their feet, but these generally disappear before they are fit to show. It is not advisable to breed from the Blacks, even should they be perfectly sound in colour. The Whites from the cross are usually very pure, and altogether the cross is beneficial to them, only that perhaps a little shorter feather is produced thereby, and they may not be quite so rich in leg colour, as if bred from Whites on both sides. Crossing the two varieties seems to multiply the quantity of feather upon them, though as before, it may shorten it a bit in the Whites.

Cuckoo Pekins.

Cuckoo Pekins are not so often met now (1911) as they were years ago, and do not seem likely ever to become so popular as Blacks or Whites. Seeing that the colour is identical with that of the popular Plymouth Rock, or Scotch Grey Bantam, this is rather to be wondered at. We seldom or never see a really first-rate specimen at a provincial show. One drawback to the breed is the difficulty of getting the birds true to colour. Like the two varieties just named, there is much variation in the several strains extant, in ground-colour, but the colour should be very uniform all over the bird: a soft pale shade of blue, with sharp clear definite barring upon each feather, black or as near black as possible, and the barring extending down the feather right through the fluff to the skin. This is an extremely important point. Many a bird looks all right, and in the hands of some judges will win, from mere outside colour, when there is no fluff barring at all; but such birds ought to be rejected both by breeder and exhibitor, as they are not what is required in a first-class stock or exhibition bird. Again, never select a bird with any great amount of white in the tail or flights when opened out. It only leads to disappointment.

In mating up the breeding-pens it would be well to use two separate pens where space allows, for cockerel- and pullet-breeding. For



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FRIZZLES. BUFF PEKINS. GOLDEN SEBRIGHTS.

JAPANESE. BANTAMS. OLD ENGLISH GAME.

cocks, choose a sire of the darker shade, with good level ground-colour, no white in tail or flight, tail well barred down to the root of each feather, fluff barred down to the skin, although this is difficult to get in cocks. Mate him to three or four pullets or hens of the medium shade, equally good in all points just named. Reject birds having white tail, but a little black does not matter at all.

In the pullet pen I should use a lighter shade of cock, but quite free from any signs of brassy feathers on back, which is a grievous fault. See that the breast is clear and finely barred, not blurred and indistinct; this is most important in pullet-breeding. As in the cock pen, reject those with white in tail. Mate him to clearly barred hens or pullets as near the show ideal as you can get them, nice and clear in ground-colour, specially sound black in the barring, and as fine as possible. The cockerels from this pen will be found useful if mated back the following year to the hens again, as well as mating cockerels and pullets together. Should any of the pullets come black from either pen, you may mate these to a distinctly barred light shade of cock, with excellent results; and the pullets from this cross, apart from being good exhibition birds, are very useful pullet-breeders if mated to a pullet-bred cock.

Partridge Pekins.

The next and last variety of Pekins, the Partridge, is one of the latest additions. These are somewhat behind the other varieties, except Cuckoos, both in popularity and quality. They are of course diminutives of the Partridge Cochin, and should resemble their bigger confrères in colour and general shape; but—in the pullets especially—great difficulty is experienced in getting the ideal in correct colour and markings, combined with length of foot-feather and small size. A little reflection will show the reader that these points cannot be very well borrowed from Blacks, Whites, or Cuckoos: they must be got by constant in-breeding, and time and patience are the great essentials, in fact the only means.

The colour of the Partridge Pekin cock is easily described to those who are familiar with the brilliant orange and black markings of a first-class exhibition Black-red Game cockerel. The neck and saddle are more heavily striped with black, but in other respects both top- and under-colour are identical. This striping should be extremely sharp and clear, not a woolly blurred attempt at striping. Look at the striping of a first-rate Partridge Wyandotte cockerel, and you have at once what is required in the Partridge Pekin cock. The neck hackle feathers are however sometimes a shade more coppery towards the head, running down to a pale golden on the shoulders, than we see in the best Black-red Game. The breast, thighs, and fluff should be a sound black, the greener the better, with no coppery lacing or rust, and the feet should be well furnished with long black feathers to the end of the middle toe, as free from white as it is possible to get it. The hen to match should be a deep brown partridge colour, having a sort of golden cast about it when seen in certain lights, and should be richly, sharply, and finely pencilled with narrow black, not running straight across the feather, as in Hamburghs, but in parallel zigzag courses, and following the round-ended form of the feather. The hackles should be a pale golden. The ground colour and the pencilling constitute two of the greatest difficulties in breeding good pullets of this variety.

It will be readily seen that it is all but imperative that two separate pens should be used for the production of Partridge cockerels and pullets. The cock pen must have the lord of the harem as perfect a show bird as can be got, specially bright in top colour, and equally in his other parts free from all trace of rust and grizzled foot-feather. The pullets or hens to go with him should be the best specimens that can be produced, save in colour and markings. The *sine quâ non* is bright neck hackling, in fact as pale as you can get it. The foot-feathering should be very ample, especially on the middle toe; legs and back short, and size generally as small as possible. For breeding the best exhibition pullets you want a cock a shade darker than the above, and if he have an abundance of rust about him he is not to be discarded. He must be correct in form, size, and in everyway up to Standard save and except in colour. He will probably be broad in stripe, and have rusty patches on breast and fluff. These are sure indications that he is what we want, viz. a typical pullet-breeder. To him mate ideal exhibition hens, sound in ground colour, sharp and defined in pencilling, with abundance of feather, and possessing as many more show points as it is possible to compass. In mating up both pens keep the general characters well in your eye. Let every bird, so far as possible, be broad in chest, short in back, and low on leg, neat in head and with ample feathering, and do not forget the middle toe feathering, as 50 per cent. fail in this respect. Strive for colour and shape first, then you may proceed satisfactorily to the other points by in-breeding, but if your colour be indifferent your birds are comparatively worthless.

Booted Bantams.

Booted Bantams are an ancient breed whose popularity has revived, but do not make the progress one would like to see, although classes are often provided for them at the chief shows, and as a rule are fairly well supported. There are several varieties of them, but the most popular are Whites and Blacks. Whites are lovely birds, but there is the usual extra trouble with them: they are more difficult to keep from sun tan, and foot-feather stain. Where however this can be satisfactorily done, and the breeder does not mind the trouble incurred, Whites are a most taking, and I think will also prove a very profitable variety.

Booted Bantams at present resemble the Pekin rather too much. They are, or ought to be, quite distinct in some respects, especially "carriage." The Pekin has its wings tucked in tightly, like the Cochin, but the Booted should have them longer, and drooping almost perpendicularly; the tail elevated, though not too near the head, that of the cock with good length of sickles and side hangers. He is longer in leg too, though the common fault is to have them too long; and with length of leg there is often too much size. In-breeding and late-breeding are the panacea for this evil. If these two methods are pursued, size must come down. Also by in-breeding the foot-feather, and hock-feather, would be easily maintained. The variety is single-combed, and should be red lobed. Lobes splashed with white are not infrequent, but it is a serious defect. The face and wattles are cherry red, the latter not too large, and well rounded. The back should be very short, the neck short and curved, the breast prominent. This makes the carriage much more erect than that of the Pekin. The hock should be "vulture," that is, contain stiff and long feathers, the legs and feet should have an abundance of feather, and especially the middle toe, right down to the nail.

In mating up a pen, which will breed both cockerels and pullets of show calibre, see that you have your birds extra short-backed, with any amount of shank, hock, and foot-feather. See that the lobes are a good coral, and the comb a medium size, well pointed. In Blacks the under colour or fluff should in first-class specimens be dark right down to the skin. Reject white fluffed birds; it is a mistake breeding from these. A cross of Blacks and Whites is useful for the remedy of any straw or creamy tinge in the white birds, but any Blacks that come from the cross will have white fluff, and it is not advisable to keep them. The Whites may have a bluish tinge on the leg from the cross, but this can easily be bred out the following season by keeping exclusively to Whites, and recrossing the half-bred with a whole-bred White. Mark the White-bred Blacks when you can, or you may have some trouble with them. If you bred from them too much it is probable you would get white in foot-feather and tail, and the objectionable grey in fluff, which is a serious failing.

There is a sub-variety whiskered or muffled. Many people would not care for these. Somehow a muffled fowl to many carries a kind of mongrel appearance with it. Splashed and spangled Booted are occasionally seen, but they do not make progress. One can well imagine that if almost perfect specimens could be bred, they might be extremely beautiful, and might catch on. So far they are under a cloud.

Hatch out Booted Bantams from April to end of June or July; they will then do very well. They thrive as chickens with ordinary care, and are hardy, but of course the more you in-breed to reduce size, the more delicate the produce becomes. A little difficulty may possibly arise in the matter of obtaining fertile eggs, but this need not arise if proper precautions be taken, and the physical disability from the long foot-feather of the cock be removed. Nothing need be done to the hens, but most of the foot-feather of the male should be removed with a pair of scissors. This of course ruins the bird for that season's exhibitions, but one cannot both breed successfully and show at the same time. If you persist in exhibiting at the breeding season, you will have to reap the fruits in delicate chicks or no chicks at all. Three hens will be sufficient for each cock.

In keeping Booted, as in Pekins and Brahmas, some extra provision must be made in the runs and houses by way of preserving intact the foot-feather. The runs should be covered wholly or in part. It would never do to let the birds tramp about on wet sticky soil, and the way to avoid this is by a roof to the runs. Then the run should be boarded, say about 18 inches from the ground. This will shield the birds from inclement weather, high winds, etc., and be productive of more fertility and earlier eggs. The bottom of the run should contain fine sea sand, or river sand, to the depth of four or five inches, or in lieu of this some soft material such as oat husks, or what is known by the name of "seeds" or chaff, wherewith to make a soft footing. The oat husks referred to can generally be procured from a miller at about 3d. or 4d. per sack. The inside of the house should be treated just the same as the run. There need be no perches, as the birds will roost on the ground, but the houses ought to be raked out every day, else they are virtually spending the night sleeping on an accumulation of dung. Now and again replace the old with fresh clean stuff. The fancier will be well repaid for a little extra trouble over these matters by having the foot-feathering always in exhibition form, which is half the battle when the bird comes to the show-pen. Damp runs, foul houses, and general carelessness spell failure with Booted or other feathered-legged Bantams.

Scotch Grey Bantams.

The Scotch Grey, or, as it is sometimes called, the Cuckoo Bantam, is one of the oldest and most interesting of all the varieties of Bantams, but is naturally more popular in Scotland than in England. The hen is very docile, a capital layer, and the chicks are fairly hardy and easy to rear. The colour is almost the same as that of the most popular of large breeds—viz. Barred Rocks, so that I have often wondered that the variety has not been even more extensively bred than it has. It reproduces well to type, and requires no great experience to keep up a bird to average form, though if an amateur wants to keep in front of the hottest battle at Sydenham and Bingley Hall, he must be prepared to devote much thought and attention to them. He must also be prepared heroically to suffer chagrin at the way some "reporters" dismiss really good specimens by simply announcing some little fault they have. Good as they are to breed, too, nevertheless white feathers *will* come in wings, sickle feathers, and other places, and some cockerels have quite a provoking way of throwing these white, and even brown, feathers at the very last moment, when the breeder has just begun to congratulate himself that he has got them into their exhibition suit without. Black or white sickles; brown saddles; white flights!—"there is many a slip 'twixt the cup and lip."

The ground colour of the Scotch Grey Bantam calls for a remark. Most of the Scotch birds I have seen are too dark, and the barring somewhat indistinct, whereas many English specimens have the reverse fault, and run too light in ground colour, which gives a faded, washed-out look. The happy mean between the two seems to be the desideratum. The ground should be a clear distinct steel-grey colour, with close narrow distinct *black* barring; and this black should extend itself clean across the feather, whereas, in many specimens, we find it more or less as a blot in the centre. In other words, the principle of the marking should be pencilling, rather than any tendency to mooning; a modification of the former, rather than that of the latter. A bird with the latter tendency often does not present much difference from one having the correct marking when in the show pen; still it is easily distinguishable when the bird is handled, and is wrong. Breeders should therefore be very careful on this point, and choose only such birds for the breeding pen as are correctly marked. They may develop white in tail the second year. In fact, it is rarely we see a two-year cock's tail sound in this respect. Still, if his barring is good, take him in preference to a blotchy-barred bird, whose second year tail may be all right.

The legs should be fine in bone, and white, free from feathers. Yellow and dark legs should not be tolerated, though spotted legs I do not greatly object to. The deaf-ears will give some trouble to keep up to a good coral red, like comb and face. It is a difficult point, and must be carefully attended to, for Nature in some strains seems determined to assert herself, and let in a certain amount of the objectionable white. It is a curious thing that the black chicks produced from the Greys are more prone to contaminated lobes than the barred ones. Do not be alarmed by a batch of black "Greys," and rush into complaints that you have got cross-breds. We do not want the majority black; but a fair sprinkling is indicative of good chances for those that are barred: and when no "sweeps" are to be seen in a brood, the Greys are generally too pale and washed-out in colour. Not only will you find that you have black chicks amongst your broods, but they will often come with quite bronzy neck hackles. At present the majority of Scotch Greys are too big and coarse, and want fining down a lot in both size and bone. They also want improving in style and carriage. Sometimes we see the results of attempts to improve these points in birds of a distinct gamey type, short and narrow in feather, and too long in leg. Then there is a type of bird much too long and narrow in back, and, worse still, with squirrel tails. What we want is a short, broad-backed, full-chested, and full-feathered bird, more like the Black Rose-comb; head erect, and tail flowing and well thrown back.

Year by year it becomes more evident that the best cockerels and pullets on exhibition have been produced from the same pen. Here is a very great incentive to the breeder of this variety. Every bird from a rightly-mated pen has the same chance, and he can rear double the number of birds on the same ground likely to turn out winners, than he could do of those breeds which require double pens. One thing he must take very great care about, as it is especially a law of breeding when only one pen is used. Never fix a fault. Never, under any circumstances, use stock birds that are both of them white in ears, or that have their feathers tipped with white. If the birds show a tendency to light ears, use every means possible to stamp out this grave defect, by using a cock thoroughly sound in his lobes, and which has been bred from sound-lobed birds. The following year use only the best of his produce, mating the sound-coloured pullets back to the sire. Examine also the quality of the barring. See that it is sound, and goes right across the feather. Reject any bird with a tendency to spangling, or that is too light or too dark in colour, though if your mate be too light or too dark, you may with profit put to him hens erring in the opposite direction. And have no white in tail or flights in the breeding-pen.

Keep to one strain only. Procure the best birds at the outset that the purse will allow from some successful breeder. Get the right thing to begin with, and keep to it wholly and solely so long as you can rear the chickens, keeping a strict account of the pedigree of each bird. How this can be done without losing stamina has been shown in an early chapter of this work. In the attempt to improve them, there should on no account be any raw importation of the blood of another variety. If the pedigree of each is strictly kept the breeder has a plain course before him; knowing exactly how such and such a bird is bred, notwithstanding some glaring fault it may have, he is still able to use it, often with more advantage than if it were an exhibition bird; but when no record is kept he is completely at sea. By keeping a pedigree list many a bird becomes worth pounds, when, without it, it would hardly be worth as many shillings.

Breeding should be done on the principle of in-mating. Breed late also; by so doing you will reduce size. Strive after the style and shape of the Sebright or Rosecomb, and go dead against long leg, white or black feathers, splashed lobes, long narrow backs, squirrel tails, spangled feathers, and all colours of legs other than white or mottled. Aim for the medium shade in colour. Get the barring glossy black, and as sharp as possible; the feather broad and flowing, comb evenly serrated and a nice medium size. Then the judges will not forget you, and you will have produced something which they can honestly and honourably reward as a triumph of science; but—no art, please!

Nankin Bantams.

Nankin Bantams are another ancient and really distinctive breed, but seem to have fallen on evil days, and become "beautifully less" almost to the point of extinction. I had them some thirty years ago, and had I kept them to the present could have exhibited them, I think, as Buff Orpington Bantams: they were a great deal nearer the mark than the present-day apology for a Buff Orpington Bantam. I never saw such a mixed lot of Bantams collected under one common name before as the so-called Buff Orpington Bantams at Carlisle in 1899. Barring the name, there was nothing buff about them at all. The old Nankin, in point of colour, would have had quite a walk over. During the past year, however, at close upon three score and ten shows, I do not remember seeing more than a couple of pens of genuine Nankins.

These birds are single-combed, cherry-faced, blue-legged, red-eyed. In colour the cock is a deep cinnamon or reddish buff, often with black in his tail; but, as in all buff breeds, the less of this, or of white, either in the tail or flights, the better. The pullet is a lighter shade of buff all through. She should be very even in her colouring, with no patchiness as if she had got about half-way through her moult, and the old feathers were contrasting with the new. Neither must the bird show any mealiness, or lacing of the feathers with a lighter shade of buff or white This is often seen in buff birds of any variety; it appears on the wing-bow and bar as well but if any set themselves to persevere with the Nankin, they should look out for these defects as they arise, and eradicate them at once, so far as they can. They can learn a lot by examining buff birds generally at shows, and fixing in their minds wherein the superlative excellences of the best specimens lie, and trying to import the same elements into their Nankin *protégés.* Perhaps we may never reach this ideal, for even at the Crystal Palace shows classes are not provided for Nankins, nor have they any place in the Standard. But who can tell? Look at the Old English Game Bantam a very few years ago; and it may be that, owing to some breeder or other of good position and powers of pushing, the old Nankin may yet jump into fame. Buff has always been a popular colour with the fancy, and so to any breeder of the Nankin we would say, *Nil desperandum.* Meanwhile breed from one pen only, and mostly for colour. When that point is once got, as it ought to be, sound, rich, good buff to the skin, free from black or white in tail and flights, and no mealiness about it, then, even if the Nankin fails to "take on" of itself, it will nevertheless form a splendid basis, say for Buff Orpington or Buff Rock Bantams. In the former one would require white legs, and in the latter yellow legs. The former when perfected would probably soon become popular, and well repay the time and trouble of production.

Japanese Bantams.

The charming Japanese Bantams are also amongst the oldest and most distinct varieties, and are included in the Poultry Club Standards of 1910. They were brought very prominently forward by the late Mrs. Ricketts, who in her day advanced the breed very much. How they will fare in the future remains to be seen. Nevertheless they are very attractive little birds, and so very different in shape and style to any other Bantam extant. No wonder Knighton Vicarage made them a great hobby, and liberally patronised any shows where classes were provided for them.

Japanese are very short in thigh and leg, in fact so much so that their bodies are only just clear of the ground; the lower they are the better. Their wings being somewhat drooping and long, actually touch the ground, whilst the tails assume a directly perpendicular position, almost touching the head. The Whites are most popular with the fancy; but Blacks, Greys, and Buffs are also successfully shown.

In Whites the body is white, whilst the sickles and hangers, or tail-coverts, are black, with a very sharp and distinct, but narrow lacing of white round every feather. The primaries and secondaries of the wings have the inner web black. Altogether the *tout ensemble* is very charming, aided, as it is, by the piquant style of the little bird. The comb is single, face and ears red, legs and beak yellow, the feet with four toes.

The Blacks are the same shape and style as the Whites, but a sound black throughout. In consequence they are not quite so taking as the Whites, though they have many admirers.

The Grey cock should be a silvery white on back, wing-bow and hackles, on a black ground. The hen is finely laced with silver, the lacing to be clear and distinct. Wattles, comb, ears, and face are a clear cherry-red, eyes red, legs and beak yellow.

Buffs should be what their name implies, a good sound buff throughout, including the tail and the flights.

Japanese, as a rule, are not difficult to breed and rear, providing the ground is dry, and the runs fairly well sheltered. They are, however, hardly adapted to cold, exposed situations, nor to places with strong, cold, clayey, retentive soil. They breed true to colour and type. No doubt this arises from the fact that they were probably bred for generations before being brought into this country. The older a breed is the purer it breeds; the nearer it is to its origin, the more difficult becomes the task. I can recommend Japs strongly to ladies. They are taking little birds, look well on a lawn, and do very little damage in a garden, as by reason of the fact that their legs are so very short, they cannot compass much scratching.

Silkies, Frizzles, and Rumpless.

A group of Bantams whose distinctive points lie in the formation or character of the plumage, is represented by Silkies, Frizzles, and Rumpless, all of which have Bantam representatives, but usually have to take refuge in a mixed class. The popularity of the Silkie fowl has already been alluded to, and its points described. It was Bantamised many years ago, and specimens exhibited of white, black, and brown plumage; but the crosses by which the diminutive size had been attained were too evident in red faces, and occasionally almost single combs. In this edition (1911) it is necessary to state that under present conditions Silkies are not recognised as Bantams, and are not therefore eligible to compete in Bantam classes. Despite this decision the Silkie merits mention here by reason of its *indirect* connection with the Bantam fancy, and great usefulness to Bantam breeders. Not only are Silkies good layers, and their eggs wonderfully fertile, but, if bred at the right time, they are sure winter layers, and provide very early sitters for early Bantam eggs. Not only will they sit anywhere and for any length of time, but when broody they will often " mother " newly-hatched chicks without having actually gone to the nest for a single day. Twice, having noticed them walking about quietly clucking, and showing other signs of a broody fit coming on, I have taken them straight to the youngsters already hatched out by a hen too big, but the only one available when the eggs needed to be set; and the Silkie has at once relieved the other bird of any further responsibility for the brood. This is often a very useful trait in their character. But still further, cross them with Pekins, and you have, as already remarked, the very best sitter and rearer possible for Bantam eggs, so much so, that I often wonder why some people do not make a speciality of breeding these crosses. Once, after mentioning their merits in an article, I was simply inundated during the next breeding season for specimens of it, far in excess of any I could supply, having fifty or sixty applicants after I had none to spare. At the early part of the breeding season such birds will fetch from four shillings to six shillings each when broody, for they are invaluable upon small, thin-shelled eggs, owing to their extreme lightness, and to the very great care they take both of eggs and chicks. They will sit for six weeks with the greatest composure, and even longer, if required ; but by the time they have brought off a second brood they are so poor in flesh as to have little heat left in their bodies, and it is advisable to give them their second chicks, and let them go their way.

The Frizzles which are shown as Bantams, are believed by some to have come from Japan, and it is not unlikely that a dwarf race should do so. They have been shown with all sorts of combs, clean and feathered legs, four and five toes. The Standard allows single or rose combs, but demands clean legs and four toes, the shanks being exceedingly short. They are very pretty when small enough, and many have been shown very small indeed. They require great care in wet weather.

Rumpless Bantams have been shown in all colours, and both clean-legged and booted, but after what was said of the parent race, mention is sufficient. They are hardy, but the same precaution is required to ensure fertile eggs as in the case of the larger variety. Their colours and marking are obviously derived from the Bantam breeds with which they have been crossed.

We come finally to a large family of Bantams of modern origin, reproducing in miniature almost all the known breeds of larger fowls, and produced in most cases by mating the smallest specimens procurable with the nearest or most suitable Bantam breed available, and in-breeding the produce. The large Asiatics were amongst the first to be thus bred down, Pekin and Booted being mostly used to cross with Brahmas and grey Aseel to produce the Brahmas, and Game Bantams to reduce the size of the smooth-legged Asiatic breeds.

Brahma Bantams.

Brahma Bantams are of quite modern make, and, being in few hands, outside the two or three largest shows very few classes are provided for them. They are a taking variety, and very hardy, yet it is doubtful if they ever rival the Pekin or Booted in popularity, being difficult to keep down in size, and also to breed true to colour. The foot-feathering, also, is not easy to obtain in the length and amplitude we should like to see it, quite 50 per cent. of the present Brahma Bantams failing in this respect. There are two varieties, as in the Dark and Light Brahmas. It has been no light task to get these massive birds down even to the present size, and still the Brahma Bantam is too large. The Lights are most in favour, from the greater ease with which they can be bred true to colour, but the Darks also are very handsome birds indeed, in fact a most taking variety. Chicks from both varieties are fairly hardy, and easier to rear than either Sebrights or Rosecombs, and the hens are good layers of tinted eggs.

In shape they are not unlike the Pekin. The cock is a trifle longer on the leg, and the hens are longer in back and tail than Pekins. The cock in both varieties should have a triple or pea comb, face, wattles, and ear-lobes red. The Light cock should have a silver hackle, with sharp dark striping towards the bottom ; back, wings, shoulder, breast, and thighs white ; the tail black, with the two top outer feathers slightly but sharply edged with white ; legs yellow, heavily feathered with white feathers to end of middle toe, the freer from black the better ; beak yellow, to match the legs ; and eyes yellow or red. The hen is similar to the cock in colour ; the hackle is white, distinctly striped with black towards the shoulders, the rest of her quite white, save the tail, which, like that of the cock, is black slightly edged with white, her legs, beak, and eyes yellow (latter sometimes red), and she must be abundantly feathered on legs and toes with white feathers. The *tout ensemble* is pleasing in the extreme.

The Dark Brahma cock is identical in colour with that of the cock in the giant variety, and must have all the properties described for the Lights in perfection. His hackle is silvery (not creamy) white, heavily striped with black, the striping increasing in width as it falls more upon the shoulders. The neck should be short, and the hackle abundant. The breast, fluff, and foot-feathering must be a sound, intense black, as sheeny on the former as you can get it ; tail, shoulders, wing-butts, and wing-bar a good sound black too ; whilst the back, shoulders, and wing-bow are a clear, silvery white, without any admixture of coppery or chocolate feathers. The saddle hackle resembles the neck hackle, tail a rich green glossy black, like the wing-bar ; leg and toe feathering to be as black as possible, abundant and lengthy. White feathers will sometimes appear in the foot-feathering ; the less of it the better, although white will show now and again in the foot-feathering of the best Darks, and also black in that of some of the best Lights. We do not meet with these troubles much in the hens ; it is generally the cocks that are prone to be thus mis-marked.

The Dark hen should be a broken bluish grey, what is called a steel grey ground-colour, distinctly and sharply pencilled with black, down from the throat and extending over the fluff as much as possible, the ground-colour and pencilling being the chief points, together with abundance of feather especially on feet and toes.

Breeding Brahma Bantams.

In breeding Dark Brahma Bantams, the best course to pursue is to use two pens; in fact, wherever the colouring of the male bird in any breed differs materially from that of the female, the double system of mating is preferable, and in some cases imperative. For cockerel mating, I should require the soundest coloured exhibition specimen I could compass, no tips of white or lacing on the black parts, but the colours sharp and decided, with no intermingling of straw, brassy, or bronze coloured feathers anywhere. The pullets or hens to go with him need not be up to exhibition standard in colour. Size, or rather the want of it, extra silvery hackle, abundance of feather, and correct shape are the *desiderata.* If your hens are a little washed out, either in ground or pencilling, it hardly matters, as they will produce good cockerels, *i.e.* if they are of a reliable strain. Remember that in all your breeding "strain" has most to do with success or failure. Now and again birds apparently fulfilling all demands for the breeding-pen come to hand, and some are tempted to use them, judging purely by appearance only; but the produce often clearly indicates that they have been bred anyhow, and were altogether worthless.

In pullet-breeding the order must be reversed. The cock should have all the qualifications described before, except that if he shows a little lacing on breast, and fluff, and even on the wing-bar, all the better; it is indicative that he has come of a pullet-breeding strain. But the pullets to go with him should have no such flaws in colour. They should be extra good in ground-colour and pencilling all over the body, breast, back, and even fluff as far as possible. From the produce it would be advisable to save three of the best coloured and marked pullets, and also a couple of the best cockerels, and if these are mated together another season you will thus establish for yourself a thoroughly reliable pullet-breeding strain, whilst you are improving ground-colour and pencilling, and also reducing the size considerably.

Lights hardly require the dual system, the feathering of cock and hen being similar in colour. A cock with a medium shade of hackle should be used, by which I mean the striping should not be too heavy, nor yet the hackle altogether too silvery, but about even quantity of both. Let what there is of the striping be sharp and dense, not washed out nor mealy. He should be a good colour throughout, have plenty of feather, and be a good shape, and his head should be A1 as to comb and wattle, lobe and eye. To such a bird should be mated four pullets, not more. Two I should select fine in striping, and sharply but not too densely striped in saddle and neck hackles. Two others should be as sound in white on back and wings as can be procured, and white in under-fluff, but the pullet-breeders will require to be as broad in hackle striping as possible, dense, and well defined. From such a pen as this, both good cockerels and pullets should result. Of course, two separate strains could soon be established, the one for cockerel- and the other pullet-breeding, but where such can be avoided it gives the breeder a chance of raising more chickens that are likely to turn out winners; for by the other plan all the cockerels on one side, and all the pullets on the other, though invaluable from a breeding point of view, would be unfit for the exhibition pen where the competition was good.

Brahma Bantams require the same kind of accommodation as Booted and Pekin Bantams. The main thing in their upbringing is to find them a run where the foot-feather can be preserved intact, no small consideration with all foot-feathered breeds.

Malay Bantams.

The Malay is, or ought to be, wholly different in points from our English Game, and in the big breeds it undoubtedly is so; but I regret to say that in Bantamising these birds a great deal of Game Bantam blood seems to have been introduced, and in consequence there are many birds passing under the nomenclature of Malay Bantams which do not bear as they should do the principal characteristics of the larger fowl, of which they purport to be dwarfs. Therefore, in judging Malays great care is required, and adjudicators should go as much as possible for Malay type, rigorously rejecting all that show strong traces of the "base" origin. A Malay Bantam should first show type, shape, and carriage; then head points, size, and colour. The latter is only a secondary consideration, for no matter how small, and of what colour, if type, carriage, and general character be wanting the bird is not a true Malay. Malay Bantams are, as a rule, too large, hence the temptation to dwarf them by crossing with the Game Bantam. Still, good true-typed small specimens are to be found here and there at some of the best shows, and when so found, as Captain Cuttle says, "should be made a note of." What fanciers should do is this: They should first get the true characteristics, and then in-breed and late-breed from this true type. They will never get the desired effect the way some of them seem to be going about it.

There are four varieties of Malay Bantams, Reds, Whites, Piles, and Blacks. The two former are those chiefly figuring at our shows; very seldom do the others put in an appearance, though they are bred in some parts. Of the Reds and Whites one good thing can be said: they are not all in the hands of one or two breeders. Their many admirers are widely spread, and this augurs well for the future prosperity of the breed.

In conformation, colour, style, etc., the Malay Bantam should be a perfect miniature of the larger fowl. The beak should be strong and curved, horn colour or yellow, latter preferred, expression fierce, owing to the overhanging eyebrows and cruel look of the eyes, which are deeply sunk in the head, and may be either daw or yellow. A walnut comb well set on the front of the head, face, lobes, and wattles red, give a *tout ensemble* by no means alluring to other birds of their own size. The neck is long and snaky, hackle short and fine, back slopes at some length towards the tail, which in the cock should be drooping, medium length, narrow in feather and sickles, which should be slightly curved. The shoulders are prominent, broad, and carried well forward, and when the bird is in high condition have the appearance of standing out apart from the body, thus adding much to the bold appearance. The hen's tail should be short and square, and carried a little above the horizontal. The breast in both sexes is broad, deep, and almost naked of feathers, thighs long and powerful, but again with plenty of naked skin on view, and set wide apart. The yellow or orange shanks should be long and fine, round in front, toes long and straight, back toe set on low, resting firmly on the ground. The general feathering throughout should be tight and glossy, what is commonly called "hard as nails."

Of the Reds there are two legitimate shades —the dark, and the bright orange. Either is in agreement with the Standard; the latter is identical with the colour of a pullet-breeding Black-red Game cock. A partridge hen should be mated to a cock of this sort. If she be sound in colour she should produce both good cockerels and pullets, for it is one of the virtues of Malays that they come very true to colour. Then we have the dark maroon cock, and with him should go the cinnamon or wheaten hen. The breast, wing-bar, thighs, flights, and shoulder points are a lustrous black, with green black tail. The neck hackle, secondaries, or wing-ends are a deep chestnut. The feathering on the deeper shaded bird is generally shorter and harder than on the brighter coloured cocks.

Whites are a very handsome variety. The only difficulty with them is one common to all white birds, viz. that of getting them a good "blue" white, free from any trace of lemon or straw tinge. There is only one way to secure this: breed from it, and not from the tinged birds. See you have the true Malay characteristics, and stick to in-breeding and late-breeding. One pen will suffice for cocks and hens. Discard any appearance of willow leg. "Go" for orange and orange only, and if the right birds as described are secured, you will have no difficulty with this variety.

Piles naturally give more trouble. The proper colour in the male is hard to get, and when got, difficult to keep up; but if the directions for breeding Pile Game Bantams be strictly followed, namely to secure rich, deep colour, sound bars, wing-ends, and back, with no trace of rustiness, and you mate this Red cock to good type White hens, success is assured; there is bound to come a fair percentage of good birds. The following year the same lines may be pursued, if the result of the previous attempt turned out as anticipated, but another pen might well be set up by mating together for cocks brothers and sisters. Never use a Pile cock that is weak on his bay ends. It is simply courting disaster, for such birds are veritable wasters, either for exhibition or stock purposes. When my friends hear me say this, the common complaint is, "Don't; you are telling secrets too fast." My aim, however, and that of this work, is to tell beginners how they should act, and I leave no stone unturned to let them have the whole sum and substance of information gained in much experimental work. My object is not to hide, but to reveal what is really known about breeding exhibition birds, and if I bring to the knowledge of any some things they did not know before, all the better. I wish all true Bantam fanciers well, and my object is to further their interests if I can. The best specimens of Bantams are yet to breed, the highest prices yet to realise; and every fancier who gets the right knowledge, and will skilfully apply it, should have an even chance with the best of us.

Indian Game Bantams are a probable cross between the larger Cornish Indian Game and the Aseel. It was no light task to reduce such giants as the Cornish Indian to Bantam size,

Indian Game Bantams.

and, as a matter of fact, there is often yet more of the individual specimen than there should be ; but time and patience will work this out, if in-breeding and breeding late be followed up rigorously. What should not be done, is to again import into any strain foreign blood, for the simple sake of securing diminutiveness. To do so is to destroy in great part type and character ; and just as in the Malay, these two qualities should be first, over such considerations as smallness or colour. The latter have their value, but they occupy a secondary place by the side of true type and character. Anyone can breed a small bird, if they have a mind to choose small parents and in-breed ; but the result is not the proper type of Indian Game Bantam at all. Where the bird is of true blood, even though it may be a little larger, yet all the same it is the *true* breed we seek, and in the generality of cases, the patience, labour, time, and expense of procuring it thus pure, far exceeds that of the smaller cross-bred. The latter is unworthy of a place by the side of the former, and certainly should never be in front of it. The policy of crossing is pursued, no doubt, in the hope that reduced size will catch the judge's eye, and the fact of the cross remain undetected.

Indian Game Bantams have many admirers, for the miniature, after all, is a very noble and captivating little creature, and its popularity has got it so far a considerable share of attention from committees of the more important shows, who have provided classes for it somewhat freely. The Indian Game Club also, by admitting Bantam breeders within its membership, have accelerated the freer and wider classification extended to it. Altogether breeders and admirers have ample reason to be satisfied with the progress of the breed so far, and the future rests with themselves. If they rigorously keep to themselves all the choicest specimens, and, like the man who argued that money was made flat that *it might pile*, are only bent on piling up in their own yards the cream of the fancy, they must expect things to stagnate, as the breeding of Brown-red Game Bantams has done. If, on the contrary, they rather think that money was made *round* that it might "circulate," and allow others to get of the best and be in the swim, the Indian Game Bantam will not look back, but may be a thing of beauty for ever.

From these remarks it will be gathered that I am not wholly satisfied with the Indian Game Bantam as it is. It savours too much of the Malay. There is too much leg, too great length of back, and other indications of Malay blood. The sooner breeders of the variety recognise this, the better it will be for the welfare of their birds. They must stick to Indian Game, and not breed a conglomeration of any kind of Game, Malay, etc. Therefore, as said before, *type must come first*, and if the necessary shape and built be absent, the bird is better in the kitchen, than either the exhibition or breeding-pen.

The cock's head is rather long and thick, the skull broad, and the eyes (though not so much so as in the Malay) are somewhat arched, and the face "beetle browed." A moderately long neck with a strong curved beak gives the bird a powerful expression. He is pea-combed, with a red face of fine texture and fairly smooth. Pale red eyes are preferred, full and prominent. The general shape is thick and compact, back short and flat, and as broad as possible, tapering towards the tail, but not having flat sides. The breast should be deep and wide, but well rounded, with a straight breast-bone. The wings should be short and tucked in tightly to the sides, but be prominent at the shoulder points. The thighs should be much shorter than in Malays, the shanks a medium length, short, well rounded, with close fitting scales, a deep rich yellow colour. The feet should be well spread, toes straight, long, and the back toe firmly down on the ground. The tail is beetle green, medium length, slightly drooping, and with a few narrow glossy hangers at the sides. Sickles short and narrow.

The general plumage is hard and glossy ; appearance sprightly and vigorous, with a bold upright carriage, the back sloping towards the tail, the flesh hard and firm in handling. In colour the cock's feathering is a lustrous green black save on the back, which like the lower part of the neck hackle is broken with a rich bay. He is also bay or chestnut on wing-ends or secondaries. The coloured feathers of the neck hackle should be almost lost in the body feathers, and the wing-bow, though black, should have the shafts bay. The tail coverts or hangers particularly should be a rich glossy beetle green, the wing-bar a rich black. Lustre is one of the great features of this bird. There must be no flat shins, twisted toes, or crooked breast-bones. Rusty hackles, white in hackle, heavy feather, and long limbs are all serious defects.

The hen is similar to the cock in shape and build, head points, neck, and legs. In colouring she is wholly dissimilar. The ground colour is a rich dark chestnut, but each feather should be double-laced with sharp dark lacing. There should be an outer edge of sharp black, not too deep, but sufficiently distinct, and then on the clear ground of the feather there should run another sharp lacing. The chestnut ground enclosed by the two lacings should be quite free from smut, spots, or other foul marks, and be one uniform shade of chestnut. The defects in the hen, otherwise than in colour, are identical with those of the cock.

Two pens ought to be set up; it is next to impossible to manage with one. For cockerel-breeding, choose a typical show specimen. There must be no rust on him, and he must be sound in wing-ends. Then look to his breast, that it is broad, his shoulders prominent, no flat sides, not too leggy, short in hackle and back, tight and hard to handle. The hens to go with him should have all these qualifications too. Colour is not so material; shape, style, and type come first. Then choose them for preference of a rich deep mahogany or chestnut, and from such a pen you may expect good results. The following season the pullets might be put back to the sire, and the best shaped cockerels to the hens. It is a splendid plan for keeping down size. Moreover you are making your own strain, and in a season or two will be able to predict with almost certainty the kind of stock you will get. In the pullet pen things will be different. You want here correct colour and lacing, and so you had better select your cock with more or less indications of a propensity to achieve these results. If he be slighty laced on breast, or a bit red in hackle, all the better. Do not sacrifice style, type, and character for a moment, but having secured these, see that the others exist also if possible. To him mate clear chestnut ground, well-laced, typical shaped hens or pullets. The lacing should be as sharp and dark as possible, with a beautiful green gloss upon it. See that they are low on leg, broad at shoulder, and short in back, in fact as ideal specimens as you can compass. From this pen retain a couple of cockerels for next season's breeding, in addition to the pick of the pullets. The more the cockerels are laced the better; you are sure they are half-blood of the ideal hens, and if they show it in their external appearance, there is all the more chance they will prove excellent pullet-breeders. When this process has been going on for a few seasons, and especially if cockerels have been put back to their mothers, a large percentage of their blood is pure pullet, and of the richest quality. In fact a reliable pullet strain will have been set up, and must go unmixed until such time as failure to rear the chicks is evidence that a little fresh blood should be introduced. It is, however, possible to so conduct matters, by keeping two lines going from the first, that after many generations stamina is maintained.

Aseel Bantams are occasionally seen, and should of course possess all the points of their parent race, without the very heavy eyebrows of the Malay. Those exhibited generally have been fairly true to points, but the breed seems too nearly allied to the two preceding to obtain any great measure of popularity.

Spanish Bantams.

Black Spanish Bantams, although most handsome, do not appear to make headway, although single specimens exhibited by Mr. Thompson, of Kendal, and others, have been as typical as the best of their bigger brethren. They are a very taking breed, and when exhibited find such a host of admirers, that I have often wondered why they were not more popular. How they are produced I am not certain, but should imagine that a small Spanish cock put to a big-lobed Black Rosecomb hen, and the produce bred back and in-bred, would produce the desired results. I should prefer a rather large Rosecomb hen, with preference to one showing white in face. Of course you would get several Rosecombs from this cross, and a few with the desired single comb. I should breed as late as possible in the season, in order to reduce the size. The best of the pullets I should put back to the sire, and afterwards in-breed as long as the chicks were healthy and fairly easy to rear. The birds should resemble their bigger brethren in every point except size.

Hamburgh Bantams.

Hamburgh Bantams appear to be at a standstill; and were it not for Mr. Farnsworth of Lincolnshire, it is more than probable the variety would sink into oblivion. The prettiest of them are the Silver Spangles, evidently a cross between the Hamburgh and Silver Sebright Bantam, or White Rosecombs, either of which would give the desired result, although a big percentage of wasters would be produced from either cross. Still, with patience and perseverance the ideal could be reached in time, and once perfected they would be certain to become popular on account of their beautiful colour and length of feather. There is a good opening in this variety for any fancier who is prepared to devote time and patience to a very pleasurable hobby.

This is one of the latest recruits to Bantam circles, and one that appears to find many supporters, though in point of type and markings it does not make the headway we should have liked to have seen. In both colour and

Barred Rock Bantams.

type it should be as near the Barred Rock as it is possible to get them—in fact, to be Barred Rocks in miniature with the barring finely and sharply defined on a steel-grey ground colour, cobby in shape, yellow legs and beak. At the present time the barring appears to be very "smudgy" and indistinct. There is a good opening for young fanciers to take this variety up in earnest and by judicious mating to bring out the desired clear, sharp, black barring so necessary in the breed. Once this has been accomplished, there is no reason why Barred Rock Bantams should not become popular.

Minor Varieties.

As already intimated, almost every other of the larger breeds of poultry has also been more or less perfectly reproduced in Bantam size, and the very few left are probably in process of being so. All have been produced by the same general methods, crossing the smallest specimens obtainable with the most appropriate Bantam stock, and in-breeding back to the desired points; the useful offspring at first obtained being very few, but gradually increasing with time and skill in breeding. The success of any such new variety is very uncertain, popularity being most capricious in these matters, and a variety class affording very little and uncertain reward meanwhile; but the number of breeders who find pleasure in these experiments appears increasing.

Judging Bantams.

[Judging Bantams is an art in itself, and we have noticed that it is rarely performed well by those judges who principally do their work amongst the large breeds of poultry. It seems to require a "different eye," and it is pretty easy to see that the difficulty arises from the much greater proportionate value of *carriage* in the case of small birds.

All Bantams cannot be equally small. It is not reasonable that the dwarf of a Brahma should be as small as that of a Game fowl. The late Mr. W. F. Entwisle originated the useful general rule, that about one-fifth of the standard weight of the breed reduced should be taken as its Bantam standard; and while a little smaller would be so far on the right side, it is better to have the real points well brought out on this scale than to partially lose these in a smaller bird. At the same time, it is pretty obvious that smallness must be worth *more* in the scale of points for a Bantam than size in the large breed.—L. W.]

The Poultry Club Standards are here given, together with the prefatory note to the 1910 edition contributed by its Editor, Mr. W. W. Broomhead.

BANTAMS

In most varieties of Bantams the general characteristics are similar to those of the large breeds which they represent in a diminutive form. Hence it is only necessary to mention weights. Where standards have been drawn up and recognised by specialist clubs they are given.—W. W. B.

Ancona.—*Cock :* 18 oz. to 22 oz. *Hen :* 16 oz. to 20 oz.

Andalusian.—*Cock :* 18 oz. to 22 oz. *Hen :* 16 oz. to 20 oz.

Aseel.—*Cock :* 20 oz. *Hen :* 18 oz.

Booted.—*See* full standard on pages 535-6.

Brahma.—*Cock :* 38 oz. *Hen :* 32 oz.

Cochin.—*Cock :* 32 oz. *Hen :* 28 oz.

Frizzle.—*See* full standard on page 536.

Game, Modern.—*Cock :* 22 oz. *Hen :* 20 oz.

Game, Old English.—*Cock :* 18 oz. to 22 oz. *Hen :* 16 oz. to 20 oz.

Hamburgh.—*Cock :* 16 oz. to 20 oz. *Hen :* 14 oz. to 17 oz.

Indian Game.—*Cock,* 48 oz. *Hen :* 40 oz.

(Note.—This standard of weight is suggested by the secretary of the Indian Game Club, after discussing the question with some of the Bantam fanciers.)

Japanese.—*See* full standard on page 536.

Leghorn.—*Cock :* 18 oz. to 22 oz. *Hen :* 16 oz. to 22 oz.

Malay.—*See* standard for varieties, etc., on page 537.

Minorca.—*Cock :* 18 oz. to 22 oz. *Hen :* 16 oz. to 20 oz.

Pekin.—*See* Cochin.

Plymouth Rock.—*Cock :* 24 oz. *Hen :* 20 oz.

Polish.—*Cock :* 17 oz. to 22 oz. *Hen :* 14 oz. to 18 oz.

Rosecomb.—*See* full standard on page 537.

Scotch Grey.—*Cock :* 18 oz. to 22 oz. *Hen :* 14 oz. to 18 oz.

Sebright.—*See* full standard on page 538.

Spanish.—*Cock :* 18 oz. to 22 oz. *Hen :* 16 oz. to 20 oz.

Sultan.—*Cock :* 16 oz. to 20 oz. *Hen :* 12 oz. to 14 oz.

Wyandotte.—*Cock :* 24 oz. *Hen :* 20 oz.

Yokohama.—*Cock :* 16 oz. *Hen :* 12 oz.

Among other breeds of Bantams which have been exhibited in this country are Burmese, Crève Cœur, Dorking, Houdan, Nankin, and Rumpless or Tail-less, also known as Manx, consisting chiefly of Game.—W. W. B.

THE BOOTED BANTAM

GENERAL CHARACTERISTICS

Head.—*Skull :* Small. *Beak :* Rather stout and of medium length. *Eyes :* Bright and prominent. *Comb :* Single, small, firm, and perfectly straight, and well serrated. *Face :* (*a*) Of fine texture, and free from hairs; (*b*) muffled (known as "whiskered") as in large breeds of fowls so adorned. *Ear-lobes :*

Small and flat. *Wattles :* Small, fine, and well rounded.

Neck.—Rather short, and furnished with full hackle.

Body.—Short and compact. *Breast :* Full and prominent. *Back :* Short, the cock's furnished with long and abundant saddle feathers. *Wings :* Large and long, and carried in a drooping fashion.

Tail.—Large, full, and upright, the cock's sickles a little longer than the true feathers, and slightly curved, and coverts long, abundant, and nicely curved.

Legs and Feet.—*Legs :* Thighs short and well feathered at the hocks; shanks fairly short, and heavily feathered on the outer sides with long and rather stiff feathers, those growing from the hocks almost touching the ground. *Toes :* Four on each foot, straight, and well spread, the outer and middle toes being very heavily feathered.

Carriage.—Erect and strutting.

Weight.—*Cock :* 24 oz. *Hen :* 20 oz.

Plumage.—Long and abundant.

COLOUR

THE BLACK

Beak : Black or horn. *Eyes :* Dark red or very dark brown. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Black.

Plumage.—Black, as lustrous as possible.

THE WHITE

Beak : White. *Eyes :* Red. *Como, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* White.

Plumage.—Pure snow white.

SCALE OF POINTS

Colour : of plumage, 20 ; legs and beak, 10	30
Leg and foot feathering	15
Type	15
Head	15
Size	15
Condition	10
	100

Serious defects : Other than single comb; other than four toes on each foot; wry tail; any bodily deformity.

THE FRIZZLED BANTAM

GENERAL CHARACTERISTICS

Head.—*Skull :* Small. *Beak :* Short and strong. *Eyes :* Full and bright. *Comb :* Single, medium in the cock and very small in the hen. *Face :* Of fine texture and smooth. *Ear-lobes :* Of moderate size. *Wattles :* Pendulous.

Neck.—Short, that of the cock being abundantly frizzled.

Body.—*Back :* Broad and short. *Breast :* Full and round. *Wings :* Long and drooping.

Tail.—Rather large, erect, very full but loose, the cock having good sickles and plenty of side hangers.

Legs and Feet.—*Legs :* Very short, and the shanks quite free from feathers. *Toes :* Four on each foot, and well spread.

Carriage.—Erect and strutting.

Weight.—*Cock :* 20 oz. to 24 oz. *Hen :* 14 oz. to 1 [illegible]

Plumage.—Moderately long, hard, and wiry, each feather curled towards the head, and the frizzling as close and abundant as possible.

COLOUR

Beak : Yellow or horn in Whites and Buffs; dark willow or black in dark varieties. *Eyes :* Brilliant red. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Yellow in Whites and Buffs; dark willow in dark varieties.

Varieties.—Black, Black-Red, Blue, Buff, Duckwings, and White, the colour in each to be the same as that mentioned for large fowls of those varieties.

SCALE OF POINTS

Curl	25
Colour	20
Feather	15
Type	10
Condition	10
Weight	10
Head	5
Legs and feet	5
	100

Serious defects : Many feathers not curled; deformity of any kind.

THE JAPANESE BANTAM

GENERAL CHARACTERISTICS

Head.—*Skull :* Rather large and broad. *Beak :* Strong, and well curved. *Eyes :* Large. *Comb :* Single, large, erect and straight, and evenly serrated. *Face :* Smooth. *Ear-lobes :* Of medium size, and smooth. *Wattles :* Of medium size and pendent.

Neck.—Rather short, curving prominently backwards, with abundant hackle flowing well over the shoulders.

Body.—Short, deep, and compact. *Breast :* Very full, round, and carried prominently forward. *Back :* Very short, the cock's furnished with abundant saddle hackle. *Wings :* Large and long, carried with the points almost under the stern and touching the ground.

Tail.—Very large, somewhat expanded, carried upright so as to come almost in contact with the back of the comb, the cock's "sickles" (the longest feathers are really not sickle-shaped) very long and only slightly curved.

Legs and Feet.—*Legs :* Very short, the shanks smooth and free from feathers. *Toes :* Four on each foot, straight, and well spread.

Carriage.—Very upright, the breast forward and the head and tail almost touching each other.

Weight.—*Cock :* 26 oz. *Hen :* 22 oz.

COLOUR

THE BLACK

Beak : Yellow, or yellow shaded with black. *Eyes :* Dark red. *Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Corresponding with the beak.

Plumage.—Lustrous black.

THE BLACK-TAILED WHITE

Beak : Yellow. *Eyes, Comb, Face, Wattles, and Ear-lobes :* Bright red. *Legs and Feet :* Yellow.

Plumage of the Cock.—White, with black markings. *Wings :* Primaries, dark slate or black, edged with white ; secondaries, dark slate or black, with wide edging of white ; the wing, when closed, shows white only. *Tail :* Black, the sickles and coverts edged with white. *Remainder of Plumage :* White.

Plumage of the Hen.—*Wings :* As in the cock. *Tail :* Black, with white coverts. *Remainder of Plumage :* White.

THE WHITE

Head points, Legs and Feet : As in the Black-Tailed White.

Plumage.—Pure white.

OTHER VARIETIES

Other varieties are the Buff (in colour similar to buff fowls), the Cuckoo (in colour and markings similar to the Scotch Grey), the Grey (black ground colour, the cock's back, hackles, and wing-bows silver, the hen being laced throughout with silver and the neck-hackle heavily marked), and the Speckled (black and white with even markings).

SCALE OF POINTS

Type	50
Colour	20
Weight	10
Condition	10
Head	5
Legs and feet	5
	100

Serious defects : Comb other than single ; shanks other than yellow (or in Blacks yellow shaded with black) ; pure white in any part of the plumage of Blacks ; other than white plumage in Whites ; long legs ; low tail carriage.

THE MALAY BANTAM

GENERAL CHARACTERISTICS

The general characteristics are similar to those of the Malay fowl.

Weight.—*Cock :* Under 56 oz. *Hen :* Under 48 oz.

Size.—As small as is compatible with the preservation of Malay type.

COLOUR

The following colours are recognised by the Malay Bantam Club as show colours—viz. Black, Black Mottle, Duckwing, Pile, Red, Spangle, and White.

Beak : In Blacks and Black Mottles, yellow or somewhat black, yellow preferred ; in Duckwings, Reds, and Spangles, yellow or somewhat brown, yellow preferred ; in Piles and Whites, yellow. *Eyes :* Pearl white, daw (with a green shade) or yellow, but the lighter the colour the better, a red or "foxy" tinge being very objectionable. *Comb, Face, Throat, Wattles, and Ear-lobes :* Brilliant red. *Legs and Feet :* Very rich yellow, except that in Blacks and Black Mottles a slight duskiness may be overlooked.

THE BLACK

Plumage.—Glossy black, with brilliant green and purple lustres, the green predominant, free from any brassy or white feathers

THE BLACK MOTTLE

Plumage.—Ground colour as in the Black, but evenly mottled all over with white.

THE DUCKWING

Plumage of the Gold Cock.—*Hackle :* Pale straw. *Back and Saddle :* Orange. *Wings :* Bow, orange ; secondaries, white on outer edge. *Remainder of Plumage :* Black.

Plumage of the Gold Hen.—*Hackle :* Silver-white, finely striped with black. *Breast :* Salmon shading off to ash-grey at thighs. *Tail :* Lower feathers, black. *Remainder of Plumage :* Steel-grey, finely pencilled with black or dark steel-grey.

Plumage of the Silver.—Similar to the Gold, but the cock's hackle, saddle, and wing-bow, silver-white, and the hen of a lighter shade all through.

WHEATEN HENS

The Wheaten Pile resembles the wheaten-red hen in every respect, except that instead of black flight and tail feathers the colour of these parts is cream-white. The Wheaten Spangle resembles the wheaten-red hen with the addition of a plentiful powdering of white spangles. These wheaten hens are not very attractive in the show pen, but they produce the most brilliantly coloured cocks.

OTHER VARIETIES

The plumage and markings of the Pile, the Red, the Spangle, and the White are described in connection with Malay fowls.

(NOTE.—The above colours and markings are ideal, but in Malay Bantams not so much value is attached to these adornments as to type and quality.)

SCALE OF POINTS

Head : eyes, 9 ; comb and other points, 16	25
Curves and carriage	16
Reach and stiltiness	12
Feather (short, narrow, and hard)	10
Legs and feet	10
Gloss and vigour	8
Shoulders	7
Tail	6
Colour	6
	100

Serious defects : Excessive size ; and other points as mentioned in connection with Malay fowls.

THE ROSECOMB BANTAM

GENERAL CHARACTERISTICS

Head.—*Skull :* Broad and short. *Beak :* Stout at the base and rather short. *Eyes :* Full and bright. *Comb :* Neat, long, square, and well filled in front, set firmly on the skull, tapering off in width to the setting on of the leader ; the top perfectly level and full of "work" (crowded with little round spikes) ; the leader set on with a stout base, firm, long, perfectly straight, and tapering to a point ; the comb rises slightly from the front to the back, the leader rises also, and at the same angle as the rest of the comb. *Face :* Of fine texture. *Ear-lobes :* Absolutely round, having nicely rounded edges, of uniform thickness all over (not hollow nor "dished"), firmly set on the face, of kid-like texture, smooth, proportioned in size to the bird, the cock's not smaller than a sixpence nor larger than a shilling, the hen's not larger than a three-penny piece. *Wattles :* Round, neat, and of fine texture.

Neck.—Rather short, covered with wide hackle feathers, and having a well-defined curve at the back, the cock's hackle falling gracefully and plentifully over his shoulders and wing-bows and reaching out almost to his tail.

Body.—*Breast :* Broad and carried well forward and upward, showing a bold curve from wing-bow to wing-bow. *Back :* Short, broad, and flat. *Shoulders :* Broad and flat. *Wing Flights:* Wide (each feather rounded off with a broad end, not too long, but in keeping with the bird's type), carried rather low, the cock's showing only the front half of the thighs, the hen's hardly so low, but by no means carried tightly to the body ; the *Stern* flat, broad, and thick—*i.e.* not "running off to nothing" at the setting on of the tail, and having an abundance of saddle feathers, the cock's saddle hackle hanging down on either side like a fringe, and extending from his tail to the middle of his back.

Tail.—Carried well back, consisting of broad feathers overlapping one another neatly ; the cock's sickles long, broad from base to end, well circled with a bold sweep (the inner tail feathers not protruding beyond the sickles), the furnishing feathers broad from base to end and uniformly circled with the sickles, tips level, and hanging somewhat shorter than the sickles, the side hangers broad and long, and, together with the saddle hackles, hanging gracefully, and filling the space between the stern and the wing ends.

Legs and Feet.—*Legs :* Thighs short, set well apart, stout at the setting on and tapering to the hocks, the shanks rather short, round, and small. *Toes :* Four on each foot.

Carriage.—Thick-set or cobby (not dumpy).

Weight.—*Cock :* 20 oz. *Hen :* 16 oz.

COLOUR

THE BLACK

Beak : Black. *Eyes :* Hazel or brown. *Comb, Face, and Wattles :* Brilliant cherry red. *Ear-lobes :* Spotless white, especially near wattles. *Legs and Feet :* Black.

Plumage.—Black, with as bright a green sheen as possible from the throat to the sickle ends, the wing bar (of broad feathers) of extra bright green ; a point of rare quality is for the tail feathers to have a brilliant green sheen.

THE WHITE

Head points (except *Beak :* White, and *Eyes :* Red) : As in the Black. *Legs and Feet :* White.

Plumage.—Snow white, free from straw tinge.

SCALE OF POINTS

Comb..	20
Ear-lobes	15
Tail ..	15
Type ..	15
Condition	15
Colour	12
Legs and feet	8
	100

Serious defects : Stiltiness ; narrow chest ; narrow back ; hollow-fronted comb ; coarse bone ; light legs ; tightly carried wings ; purple sheen ; purple barring ; brown or grizzled flights ; coloured feathers ; "narrow-feathered ;" white in face ; blushed lobes.

THE SEBRIGHT BANTAM

GENERAL CHARACTERISTICS

Head.—*Skull :* Small. *Beak :* Slightly curved, and rather short. *Eyes :* Full. *Comb :* Rose, firmly and evenly set on the skull, square fronted, free from hollows, covered on top with coral-like points, narrowing behind to a distinct slightly upturned spike. *Face :* Smooth and of fine texture. *Ear-lobes :* Flat and free from folds. *Wattles :* Well rounded.

Neck.—Tapering ; the cock's well arched and carried very far back ; the hen's upright.

Body.—Compact. *Breast :* Broad and prominent. *Back :* Very short. *Wings :* Carried very low.

Tail.—Square, well spread, and carried high.

Legs and Feet.—*Legs :* Short, the shanks slender and free from feathering. *Toes :* Four on each foot, straight, and well spread.

Carriage.—Strutting and tremulous, on tiptoe, and somewhat resembling a Fantail pigeon.

Weight.—*Cock :* 22 oz. *Hen :* 18 oz.

Plumage.—Short and tight, the feathers not too wide, but never pointed. (NOTE.—The Sebright Bantam cock is hen-feathered—*i.e.* his neck is devoid of true hackle feathers, he has not a saddle-hackle, and his tail is free from sickles.)

COLOUR

THE GOLD

Beak : Dark horn. *Eyes :* Black, or as dark as possible. *Comb, Face, Wattles, and Ear-lobes :* Dark purple or dull red. *Legs and Feet :* Slate blue.

Plumage.—Uniform golden bay ground, with glossy green-black lacing, and dark grey undercolour, each feather being evenly and sharply laced all round its edge with a narrow margin of black.

THE SILVER

Head points (except *Beak :* Dark blue or horn), *Legs and Feet :* As in the Gold.

Plumage.—Similar to the Gold, substituting silver-white ground for golden bay.

SCALE OF POINTS

Lacing	25
Ground colour	15
Comb..	10
Face and ear-lobes..	10
Tail ..	10
Weight	10
Type ..	10
Condition	10
	100

Serious defects : Single comb ; hackles or sickle feathers in the cock ; feathers on shanks ; legs other than slate blue ; other than four toes on each foot ; wry tail or any other deformity

CHAPTER XXXVI.

TURKEYS. GUINEA FOWL. PEA FOWL.

ALL the domestic varieties of turkeys are undoubtedly descended from the wild race of North America. This no one questions now; and the obstinate incredulity of some naturalists respecting the fact is one of the most curious phenomena in the history of science. It was stated that the wild turkey could not be domesticated, and refused to cross with the domestic race; both statements having no atom of foundation, so far as we have ever been able to learn. On the contrary, the fine strain known as American Bronze owes its size and lustre to possessing about three-fourths of wild blood, some specimens being indeed almost pure wild in strain, though bred for some generations in captivity; and Audubon had long ago stated as of his own personal knowledge, that the wild turkeys frequently fed, bred, and associated with the domestic stock, and were tempted in every possible way to do so by the owners of the latter, as the half-bred birds were finer in size and hardier in constitution.

Wild Turkeys.

The varieties of the wild turkey are usually reckoned as three, viz. the wild breed of more northern America and Canada, known as *Meleagris Americana*, whose colours are confined to iridescent dark colours and bronzes; an equally fine race found in Mexico and the southern States, and hence called by some naturalists *M. Mexicana*, which is somewhat shorter in leg, and has the tail and other feathers tipped with white; and a still more southern variety found in Honduras and Central America, known as *M. ocellata*, distinguished by absence of breast-tuft, differences in caranculation, and the iridescent splendour of its plumage. The ground-colour of this last is usually described as a beautiful bronze green, banded with gold bronze, blue, and red, with some bands of brilliant black; and it is much to be desired that so magnificent a variety should be added to domestic stock; but all attempts hitherto have been unsuccessful, the birds dying when removed to a colder climate. They breed freely, however, and several times hybrids have been produced; and we cannot help thinking, as the bird is readily domesticated, that by breeding back the hardier hybrids to wild stock, the glorious plumage might perhaps be perpetuated: moreover the rearing of turkeys and tropical breeds is better understood now, than at the date of the latest attempts we ever heard of (about 1872) to domesticate the Honduras turkey.

Much useless argument has been expended upon the relation of the wild races to domestic stock, about which there is practically no doubt at all. It is quite certain that turkeys were first introduced to Europe by the Spaniards, who of course would get hold of the more southern, or Mexican bird; and hence no doubt the general prevalence of more or less white marking in all the older European varieties. But there is no real line of division between the northern and more southern birds, which breed freely together, and merge into each other on the great Continent; and there seems no reason for the difference in colour between those at the two extremes of latitude, except warmer climate and more plentiful food. These causes almost always produce some variation in colour or marking in birds, and hence the more northern turkey has itself been several times recorded to have produced white marking in the third generation of domestic rearing and feeding. The greater delicacy of the Honduras variety has undoubtedly been caused solely by tropical conditions, and it is rather remarkable that in India also turkeys are found to degenerate in size, thus showing sensitiveness to tropical heat in another way. All the varieties interbreed with perfect freedom, thus showing that they are but local varieties of one great race.

As no one ever supposed that these birds came from Turkey, or from anywhere except North America—not one single old writer can be quoted for any such mistake—the origin of the name is a very curious question. Some have suggested that it came from a supposed resemblance of the red caruncalations to the old Turkish costume of a red fez coming down to the ears, with a dark flowing robe beneath. Another guess is that the word is corrupted from *turquoise*, supposed to be applied to the bluish caruncalations about the head. Others point out that the name of "a Turk" is often applied in popular language to any one remarkable for domineering and pompous disposition, or appearance, and thus became attached to the turkey cock, and gradually modified. The reader can take his choice.

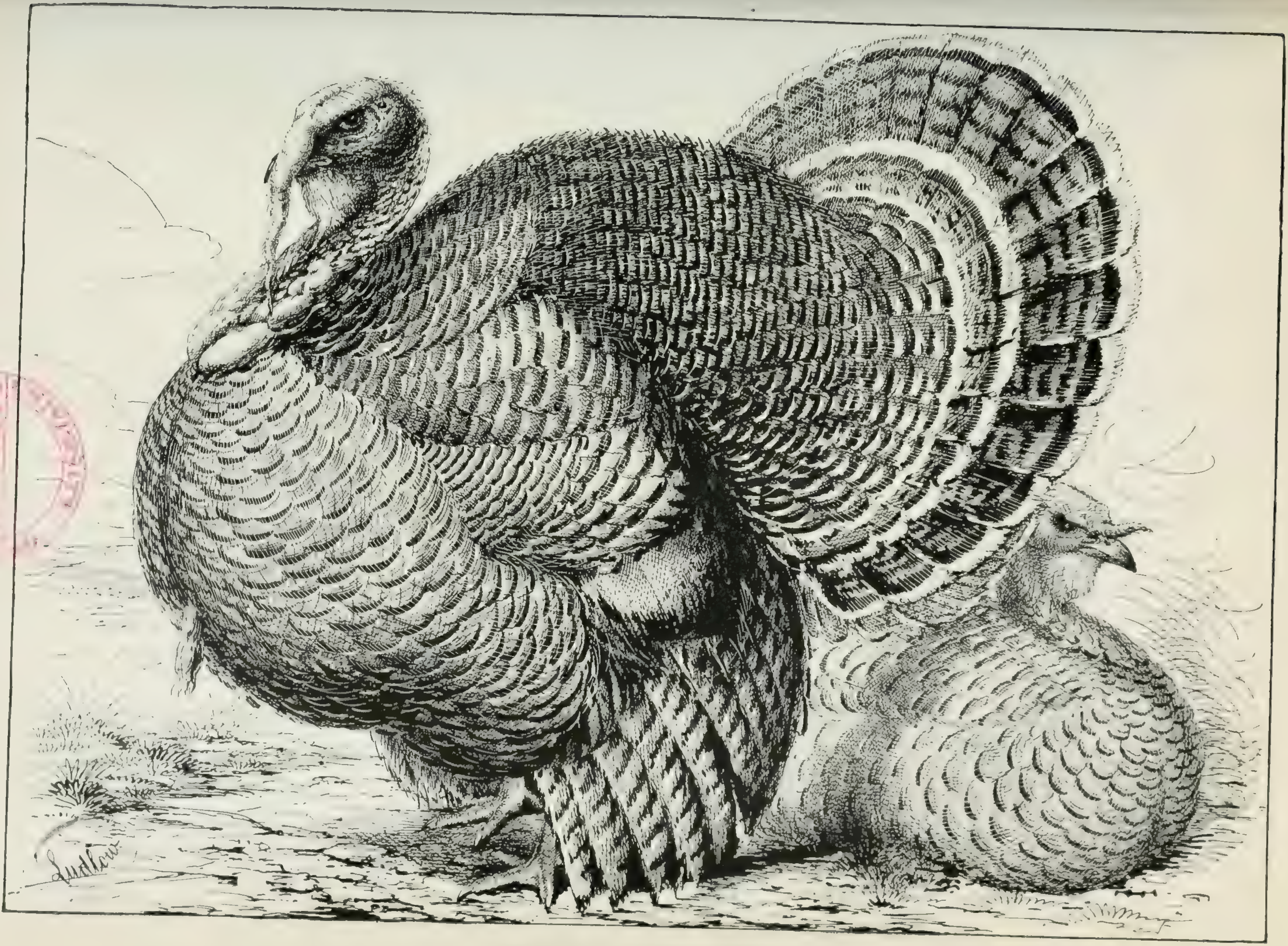
The original wild turkey is of necessity disappearing fast from the United States, as settlement extends and population increases; and, unless preserved in wood coverts as a game bird before it is too late, the time cannot be distant when it will be extinct except in its descendants. It is a fowl that can only live in its original condition upon ample ranges of forest or woodland, where the ground is quite untainted, and it can find sufficient subsistence in its own wild way. Domestication has not improved, but actually decreased its size, for wild gobblers have occasionally been shot weighing 60 lbs., whilst the heaviest American Bronze which we have record of, fed up for exhibition, only reached 46 lbs., and very few exceed or even reach 40 lbs. Domestication has also reduced hardihood in regard to weather or exposure, whilst increasing it in regard to domestic conditions. Thus the turkeys long bred in Norfolk and Cambridge have become very much smaller than the wild breed, and would perish under exposure which the wild race would brave with impunity; but on the other hand they can be reared with success in large numbers, where the wild race would die from disease, in conformity to the law explained in the first chapter of this book.

Domestic Varieties.

The domestic varieties of turkeys have undergone considerable transformation during the last generation. About 1865 those kept in England consisted mainly of the black Norfolk breed, which largely supplied the Christmas market, seldom then exceeding about 22 lbs. for full-grown cocks and say 14 lbs. for hens, and of which there were pure white and solid fawn-coloured varieties of about the same size; and the larger Cambridge turkeys, weighing about 24 lbs. and 16 lbs., of a beautiful bronze and black and white plumage, known as variegated. The birds exhibited were generally of this latter type, but of course larger, the old gobbler in the first prize pen at Birmingham in 1865 weighing 30 lbs., and the hen 17 lbs., which may be taken as about the heaviest weights obtainable in England at that time. About the same period birds of much the same stamp as these last, but somewhat finer because occasional crosses of the larger wild bird had always more or less taken place, began to be more systematically crossed and bred in that way in America, resulting in the magnificent American Bronze breed, in which white marking was much diminished, whilst colour and gloss were improved, and the size was so increased that individual specimens of full-sized old gobblers reached as much as 40 lbs. Some of these birds were imported by English breeders, and crossed upon the Cambridge, improving them both in colour and in size. A Turkey Club was also formed, which further stimulated the breeding of these fine birds. Finally the American Bronze ideal was fully accepted for this, the largest and finest race of birds, and the standard for adult gobblers raised to 34 lbs.; and so much American blood was bred into them, that English and American Bronze turkeys may now be regarded as practically the same. Meanwhile American breeders had not been idle, but introduced more and more of the fast-vanishing wild blood, breeding and rearing with such success that gobblers of 45 and 46 lbs. have occasionally been seen in exhibition pens.

The older and smaller domestic varieties notwithstanding hold their ground, for the obvious reason that there is no general market demand for birds beyond a certain size. Let any one ask himself how he could manage with a turkey weighing 40 lbs., from a table point of view, and he will at once understand why black or white turkeys whose top figure is only about 20 lbs., are still so largely bred in England and Normandy. It is the really marketable kind of bird, 10 lbs. to 15 lbs. being the weights most in demand; and moreover a great many people consider (with real foundation in our opinion) that the Black and White whole-coloured birds are somewhat superior to the Bronze in juiciness of flesh and delicacy of skin, both of which points have money value. At exhibitions where only one class is provided for turkeys, it is of course almost useless for any to compete except the immense and magnificently-coloured Bronze breed; but at Birmingham extra classes are still offered for other varieties, and these are still occupied by the older sorts. Such classes rarely have many entries of the Black Norfolk birds, whose dark plumage makes them suffer by more direct comparison with the immense Bronze exhibits, with which they cannot compete: still very fine specimens of these sometimes appear, the plumage being all black except a few touches of white occasionally, the less the better. The beaks of these are dark horn-colour to black, and the legs slaty black or lead-colour.

The entries in such extra classes chiefly now consist as a rule of Whites and Fawns, both very old breeds, as already mentioned. The Whites are often entered or described as



AMERICAN BRONZE TURKEYS.

"Austrian" Whites, why we do not know, as they can be traced back in England for over a hundred years, and there were little imports of any kind from Austria at that time. These birds should have flesh-coloured or pink beaks, and white or pale pink shanks and toes, the eyes being of the same dark hazel as the Blacks, from which they were no doubt sports. The plumage must be pure and clean white all over except the "beard" or tuft of hair on the breast, which is black, deep, and ungrizzled. They are beautiful birds, and very widely spread over the country, though seldom in flocks of any size. We found many small lots about Sussex, where they are rather liked for their white feathers, and are stated by the Sussex farmers (who should be as good judges of table quality as any) to be very fine in skin and flesh, and rather long, though not large, in body. They have been said to be delicate, but those who really kept them did not seem to consider them any more so than others.

The Fawns are much less common than Whites, and may be described as pale buff. The tails of those we have seen appeared a little long in comparison with other colours, and the bodies a little more slender. The shanks and toes are flesh-colour in such as have come under our notice. There have usually been one or two of each sex at Birmingham, but they are certainly less seen than we can remember some years ago, are not standardised, and appear to be gradually dying out in this country. We have not seen enough of them dressed for table, to judge how they compare with others in this respect.

American Turkeys.

Besides the beautiful Bronze breed, which is sufficiently described in the Standard at the end of this chapter, these are all the varieties bred in England. They are also recognised in the United States and Canada, where the fawn-colour is known as Buff, and the Norfolk breed as Black, while it is singular that Whites, instead of being termed White "Austrian" as in England, are known as White "Holland" turkeys. Besides these, Americans have three varieties not known in England. One of them is standardised as Slate, the colour being an ashy-blue resembling Andalusian colour of the dull cast, but without lacing, and which is often rather peppered with black. This does not appear much thought of; but another breed, known as the Narragansett, is next to the Bronze the largest turkey in America. The beak is light horn, the shanks salmon-colour or brown or pinky-brown. The plumage is mainly black, but most of the feathers have a band or bar of light grey or steel grey near the tip, the tip itself being a jet-black band beyond the grey, and the wing feathers barred with grey. Only in the tail feathers and inner webs of the primaries some brown is found, and the tail feathers terminate in a broad black band edged with light grey. The third variety is that known as the Bourbon Red, which came from Bourbon County, Kentucky, and had its origin in what was once known in America as the wild Yellow Turkey. The predominant colour of this variety may be described as brownish red, since that tint should be seen on the neck, back, wing-bows (deep), breast, body (deep), fluff and thighs; the tail, primaries and secondaries are white, and the shanks and feet reddish pink. Adult gobblers should weigh 30 lbs., and hens 18 lbs.

Breeding Turkeys.

We may now proceed to practical considerations. Whether turkey-breeding is profitable or not depends very much upon circumstances, and of course still more upon management. In regard to circumstances, they thrive best upon rather high and dry land, such as grows rather poor grass, and are not well adapted as a rule for low-lying rich pastures. On a holding where there is much variety in these respects, it often happens that turkeys will thrive in one field, and not in any other part; and this in spite of the general rule that they do best on fresh ground, other things being equal. On the whole they are better avoided by such as farm heavy land. Another important point is, not to rear turkeys and other poultry together. This is often seen as regards small lots; and with only a brood or two, the evil may not be apparent if there is good range; but it does not answer, and with larger numbers would be ruinous, the turkey needing ground as sweet as can be managed, and the poultry suffering somewhat also. On any given portion of a holding there may be one or the other, but should not be both.

This is the more important because a turkey-house should *never be enclosed.* Even through the winters of North America, houses open at the front are found best, and many breeders prefer to let the grown birds roost in trees, on the sheltered side of some large building. Any ordinary fowl-house is poison to them, and even if the birds have a high and roomy house to themselves, but closed in, unless the ventilation be very much more free than it is at all easy to give, they will be seen to hurry out in the morning, pining for fresher air. A high and open cart-shed may do, or a high shed open in front, and preferably with the highest part of the roof to the front, though it may of course be wired in if necessary. More shelter than is afforded by the sides and back wall, is never needed even in the most severe weather, and merely does harm.

Selection of Breeding Stock.

In regard to the selection of breeding stock, it might be supposed from what was said above as to the marketable value of the different varieties, that the exhibitor and the market breeder have quite different ends to serve in selecting their stock and rearing its produce. To some extent this is no doubt true; but it is only so to some extent, and size in the stock really is of great importance to the breeder for market also. Supposing the exhibition weight of a fully-grown gobbler of one of the English breeds to be 30 lbs., a full average weight for cockerels would only be about 18 lbs., and of course many only reared for market would be less than this. Thus, the lessons in breeding which the exhibitor has learnt by experience, are of the greatest importance to the breeder for market also; though in his case they bear chiefly upon the question of *weight at a cost*, and not, as in the exhibitor's case, of getting the utmost weight at any price. The same law holds good for both, that the finest young stock is bred from fully-matured old birds of full size, two and three years old; and especially is this true in the case of the male parent. The turkey cock is really not matured for breeding till two years old, though hens are very good at twelve months; but they will be better the next year, and quite as good if not better the year after that. Amongst many experiments which have been made on this point, the following may suffice. An unusually fine gobbler bred the preceding season, and weighing 25 lbs., was mated with year-old hens, and produced a really fine flock, some of the pairs weighing 35 lbs. by Christmas. Next year the cock weighed when mated 30 lbs., and the hens 18 lbs.: and the young stock that year averaged fully 5 *lbs. per pair more*, and were hardier, and reared with less trouble and loss. It need hardly be pointed out that it is the young birds which, with only the *same feeding and care*, make extra weight, that are reared at the least cost per pound.

To this general rule respecting the value of matured stock there are no exceptions whatever, and there is little doubt that some Norfolk breeders have been in some degree handicapped against those of Normandy and other parts of France, by trusting too much to their young stock, whilst the French breeders, though sending only moderate-sized birds to the London market, have produced these at less cost, by breeding from older birds. It may be urged that large old gobblers are often too heavy for the hens; but this can always be avoided, as it is the custom in America to do with the heavy Bronze birds, by shutting the gobblers up a while before breeding, and feeding rather sparingly, but on nitrogenous food, so as to reduce their weight, making them lean and active. This precaution is important, and should not be forgotten.

We place this rule of selecting fine and mature stock first and by itself, because it is of such wide and far-reaching importance in turkey breeding, and because the fact that immense birds are not desired for market, rather tends to obscure it. Yet the very largest birds are by no means to be preferred. Even the largest exhibition turkeys are not often bred from the largest specimens, but from vigorous medium-sized representatives of stock whose *average* size is great. A change of blood every three years or so, is advisable. Particular care must be taken not to over-feed the breeding birds, or make them fat: such plump stock may look very fine, but eggs will be small, and often infertile. This especially applies to the gobblers, and most of all if they are very large in frame; but it is applicable to the hens also. Perhaps the most important point of all in individual selection, is to get birds with a *long breast-bone*. If the dead turkeys are examined at any Christmas display, whether at shops or exhibitions, this point will be found to differ to an extraordinary extent, some birds having breast-bones very nearly twice (in proportion) as long as others. This feature alone makes a great difference in the price, and is entirely hereditary and within control: the numerous short-breasted turkeys seen at Leadenhall every winter, show that it has not received from many breeders nearly the attention it requires.

It has been proved beyond doubt that one visit to a turkey gobbler is sufficient to fecundate all the eggs laid in one batch by the hen. Some farmers who only keep a few hens and do not rear many, send their birds to stud to a neighbour in this way, and others have argued that the number of hens to one gobbler may be almost unlimited. It does not prove so in practice, again showing what has already been mentioned, that mere fecundation is not the only factor in breeding. When too many hens are mated to one tom, the produce is never the same in size and vigour, and general experience has settled upon about ten hens in a pen, as a limit that can rarely be exceeded, or at least much exceeded, with good results.

The Turkey Hen.

Domestication has greatly modified the laying and prolificacy of turkey hens. About half-a-century ago the hen usually laid twelve or thirteen eggs, in March, April, or May, more than eighteen being seldom recorded, and such second sittings as were occasionally produced being too late to be profitably reared. Two or three years ago we heard of a poult laying her first egg on December 22nd, and batches of twenty up to twenty-five are not at all uncommon, so that many birds have laid fifty eggs in one year, even a hundred having been occasionally recorded. The second batch is now often early enough to rear to profit in favourable seasons. It is very usual to set some of the earlier eggs under common hens, giving the last fifteen to the turkey herself, and adding those from the hen to the turkey's own brood.

There are different ways of managing the breeding stock, according to national custom, number kept, and range at command. One of the most successful American raisers—a lady, who rears 95 per cent. of all she hatches—usually keeps three pens of breeding birds, one tom and ten hens in each, and each pen having a run of one to three acres fenced in for them, and secluded nests arranged about the runs for the hens, easily kept under observation. Though these pens are used later for young birds also, such a plan requires room, and supposes that turkeys are the chief object of the ground thus occupied. This number of hens to one gobbler is found a good average everywhere; but on many farms only a pen of four to six birds may be kept, allowed to range at liberty, which answers very well for a few breeders, provided they are not shut in at night, and not overfed. But in such a case there must be a close watch kept upon the laying and sitting, for it is often very difficult to get hens which are left at large to lay in a house, the older breeds being in this respect better domesticated than the more wild-bred Bronzes. When about to lay, which may be known by the hens poking about in corners, they may be shut in till mid-day; then if their shed is dark on the floor, and the nests are contrived and so arranged that they look secluded, they will be induced to lay there, and once they have laid a few eggs, will continue in the same place, if not disturbed by unwise interference. Or a number of barrels and other contrivances may be arranged about the grounds outside, in secluded corners, well concealed, and watched to see if any of the birds resort to them. Now and then one will steal a nest right away, and generally does well in such a case, but there is great risk from weasels, foxes, and other vermin. When Bronze turkeys are kept "wild" in wooded parks, they are best left entirely to themselves; while on the other hand some of the older and more domesticated breeds will lay in a house as sedately as a Dorking hen.

The laying nest will very often settle the question of the sitting nest; but turkeys are such close and attentive sitters that there is no difficulty in setting them in any sitting house if more convenient. As they are very shy, none but the one regular and well-known attendant should visit them during incubation; nothing interferes so much with a good hatch as the hen being startled in any way, and failure of the eggs rarely occurs from any other cause. But the regular attendant can do anything in reason with all except the wilder birds. If a broody bird be set on a few nest-eggs at night, and an attractive-looking nest be prepared close by and filled with eggs, she will generally take possession of it next day, and in another day the real eggs may be given her; but if she does not, she can be placed on and shut in, and taken off daily, providing food (for which Indian corn answers very well) and water and dry earth close at hand. Plenty of grit should also be within reach. As already mentioned in a previous chapter, many turkeys could even be kept hatching for months continually, as in France, removing them daily to feed and to clean the nests. Some Bronze hens, however, could not be so treated, and the individual character of the stock may have to be studied, in the manner here indicated. On the whole it is generally least troublesome, when feasible, if the turkey hen sits in the nest which she has chosen herself, and where she has laid.

Insect vermin must be carefully guarded against. While dusting material should be provided, many hens rarely if ever make use of it. With outside nests on a free range this will matter little; but when set indoors, both nest and hen should be thoroughly dressed with insect powder: or the nest may be well painted over inside with one of the volatile liquid vermin-killers so popular in America (see final chapter), and the hen confined in such another nest before being placed in the permanent one. Insect powder may also be dusted on the nest when the hen is off, or even on the hen herself, when she is tame and knows the attendant well. A very large consensus of American experience agrees that success in rearing the poults after hatching depends as much upon these precautions, or more strictly, upon a vermin-free condition of the hen at the date of hatching, as upon any factor whatever, and that many cases of drooping and death formerly attributed to other causes, were really due to insect vermin.

Where turkey-rearing is a business, it is best to provide each hen with about twenty-five chicks; and as she can only properly cover fifteen to seventeen eggs herself, it was formerly the custom to put six or seven at the same time under a common hen, giving the whole when hatched to the turkey. This plan is still often followed, but many now prefer to place the surplus eggs in an incubator, which hatches perfectly well, though brooders do not answer for rearing so well as with chickens. The turkey often lays several eggs after she has begun to sit, and the eggs should therefore always be marked. The time for incubation is normally twenty-eight days, but it is not unusual to hatch either a day sooner or a day later. The day but one before hatching is expected, it is well to give the nest a good cleaning from any excrement and feathers, and both nest and hen another dusting with insect powder. She should not again be disturbed, though food and water may be left within reach. It may also be well to mention that the turkey cock should not be allowed access to the sitting-house unless he is known to be harmless; as the wild bird seeks to destroy the eggs or young chicks, and some of the domestic race retain the same strange instinct: others, however, are quite free from it, and walk about proudly with the chicks which some would, if allowed, trample to death.

Turkey Chicks.

All experienced breeders agree that the hen should be left with her chicks quite undisturbed for twenty-four hours after they begin to hatch, after which they must of course be put out. At this stage there are three requisites to be considered, viz. shelter from wet, fresh clean ground, and plenty of air. In an uncertain climate like that of England, a very good plan is to put the mother under a large crate in a cart-shed, or any other shed entirely open in the front, taking care that there is fresh dry earth underneath, and keeping it clean by diligent attention. Some breeders do very well with a large covered coop, moved every day on to fresh ground, as turkeys should not be hatched till there is likely to be fine weather. If the chicks themselves should get wet, a proportion generally perish; and while the weather is treacherous, therefore, there should always be shelter at hand under which the mother and brood can be driven when a shower threatens. Yet in dry weather, on fairly dry soil, there is no doubt that young birds thrive much better with free range after they are a week or ten days old, and have got strong upon their legs. This can often be afforded in favourable seasons, and there is no prettier sight than the stately march of a turkey hen with her brood, across an ample run where they can in great degree forage for themselves.

Rearing Young Turkeys.

These cardinal requisites of shelter from wet while young, while yet securing fresh air and ground, with ample exercise, lead to great differences in even successful turkey rearing. Mr. Tegetmeier did useful service some years ago in drawing attention to the success obtained by some breeders in America, on the plan of leaving the young broods with their mothers entirely in the open, with no artificial shelter and very little feeding. Such facts have their lessons for all breeders; but conclusions have been drawn from them which are entirely unwarranted, and which fail to take into account the wide difference in American circumstances. When, for instance, it is said that the American climate is "more severe than the British," the only reply possible is that, in regard to rearing young birds, the exact contrary is the case. Every one knows that adult turkeys are hardy, and we have already enlarged on the necessity of open shedding for the roosting birds. But at the season whilst the chicks are growing, the American climate is not only warmer, but far more uniformly dry than in this country, so that the great danger in England of exposure to wet during the period of infancy, is almost non-existent. Land is also abundant and cheap in America, and very great numbers are seldom reared on one farm. The largest breeder cited for the "natural" plan, Mr. Tucker, of Providence, R.I., only raises three or four hundred; and when it is stated that his daughter had to walk three miles to go the round of the broods, it will be obvious that such a system would fail absolutely to manage the large numbers reared by some producers for the British Christmas market. The same plan has been followed, and with the same success, by gentlemen in England who have parks, coverts, or similar advantages, and who have not to make a profit out of a market price; but for such market purposes, and in a thickly populated country, other methods must necessarily be followed, even leaving such risks as those from poachers and foxes out of account.

Neither are the older methods necessarily attended by "disaster," as is freely alleged by some. It is by them that the British market is mainly supplied, both from England itself and from France; and the large numbers reared at a profit are a very simple reply to extreme statements of that kind. Lastly, the really largest and most successful rearers, even in America, employ more moderate and domestic methods, which keep the broods more under control, while carrying out the same general principles. Differences in race also have to be borne in mind, and it is interesting to observe that in America also, where the more domesticated "White Holland" turkey is largely bred, and by many preferred for profit to the Bronze, this breed is found to require far less range than the wilder race.

While therefore the beneficial effects of real freedom and exposure deserve the attentive study of all rearers, there is more to be learnt from the general American methods, which have reduced such principles to application on farms, and we have been interested in collating more than a score of accounts furnished by different breeders concerning their systems of rearing and management. One lady already referred to, Mrs. Charles Jones, who raises turkeys on a farm in Illinois, has for years raised 95 per cent. of all she hatches in considerable numbers, and in fact finds that trifling mortality considerably less than amongst her chicks, is still of opinion, after trying the other plan, that "if you do not keep them near the house so that you can run them under cover when a heavy storm comes on, you are liable to lose a large percentage." She uses for this purpose a large shed with a board floor, and watch is kept in showery weather against all such contingencies. As birds grow they are put in flocks of about fifty, which she finds enough for one yard or field of two or three acres, till about two months old, when they are driven out to their summer liberty. Her hens are cooped for a few days, and then let out in a home lot, except for showers as just mentioned.

A considerable majority of the breeders just mentioned adopt a plan which is more or less general throughout the United States, and in a dry season is found to answer well. Three boards, each twelve to sixteen feet long and twelve to fifteen inches wide, are fastened together on their edges as an equilateral triangular pen, on a piece of grass cut very short, and quite fresh. The turkey chicks are put out in this, in the sun, and the hen put down close by to step into the pen, when she will gather them together. For about a week the boards will confine the chicks, and when they can get over them they are strong enough on their legs to be left at liberty. About three such pens, each with a hen and her brood, is considered enough for a five-acre lot or field, and gives ample range, while keeping all under control. Care has to be taken that there are no hollows in the pen, else the turkey is very apt to choose just that spot for brooding, and if it rains the water collects there and the chicks come to grief: with this precaution many of the Bronze mothers are found to shelter their broods with great care and certainty during a storm, and bring them up in safety, the White mothers being less to be relied upon in this respect. Some prefer to choose a spot for the pen which is bare of grass; and a great many move the pen every two days to fresh ground. By far the greater number agree that in the dry seasons of America, the young ones do best if given full liberty (*i.e.* in their field) with their mother after the first week or ten days.

On the other hand, some of the largest American breeders who have tried the "three-board" system, have given it up in consequence of losses; and we find this chiefly, as might be expected, in those States which have the most spring and summer rainfall. Some of these tether the mother by the leg under a shed, where she has a considerable amount of liberty: others coop her in a large slatted coop under such a shed: others confine her in a large covered coop, and give the chicks their liberty, as countless English breeders do with their hens and chickens. Much depends on whether grass is long or short, and upon the season. All agree that too many must not be allowed in one field or lot, and that it is better if there have been no turkeys in that lot the year before, when the birds are reared in great numbers; of course a brood or two ranging over the whole farm produce no ill effects.

The best English practice, it will thus be seen, does not really differ in any essential point from the best American, and so far as it does so at all, that difference is necessitated by the far greater liability to rain-storms in this country. A few people may still roost their breeding stock in close houses, and shut over-crowded broods into close coops on foul ground, and such folly must of course be often followed by disaster. But the more intelligent and successful English breeders either use open-fronted coops or open sheds, get their broods "out" as soon as possible, to roost out of doors, and so far as practicable try to rear each year upon a fresh field or part of the farm, taking a crop before young turkeys are turned upon it again. This cannot, however, always be done in a thickly-populated country like England, and in some places a system of disinfection is practised which appears to be effectual. Unslaked lime is scattered freely over the grass on a dry day, and left for about a week. Then it is scratched over by a harrow or rake, and a layer about half an inch thick put upon it of well-decayed farm manure, ashes, road-scrapings, or even arable soil if there is nothing else. This promotes a free growth of fresh grass, and next spring the ground is found sweet and recuperated.

Where there is covert, nothing may be needed in the way of shelter after the poults are once well upon their legs; but on any ordinary farm some available shelter from wet is found as necessary as ever, to which the young ones can be driven when the necessity arises. This danger remains till they have "shot the red" about their heads, which is generally at about ten weeks old. In some parts of France, whence so many birds come to the London market, sheds with dry boarded floors, and even garrets, are still used for the young birds, and the breeders affirm that without these they lose their birds from colds or cramp. Much of all this, as repeatedly explained, will depend on whether the turkeys belong to the more domestic or semi-wild races, the Bronze breed thriving where Norfolks would perish, and *vice versâ*.

Feeding Turkey Chicks.

There are somewhat similar differences regarding the feeding of turkey chicks, but here again thought and intelligence will disentangle the real essentials. The chicks at first seem stupid at picking up food, and some breeders are still accustomed to put one or two eggs from large fowls under the mother about the seventh day, so as to hatch with the others and "teach" them to feed. This may be useful, and there is at all events no harm in it; but our later observations incline us to the opinion that the turkey chick goes longer than other chickens before requiring food, and is perhaps slower to eat because less hungry. The majority of breeders in both hemispheres feed for the first two or three days upon a mixture of chopped hard-boiled egg and stale bread-crumbs. A few mix raw egg with the bread-crumb (which must always be stale), and some American breeders prefer bread-crumb soaked in milk and squeezed dry, or squeezed curd. The fact is that the young turkey chicks are (at least under artificial feeding) particularly prone to a slightly inflammatory irritation of the intestines, tending to diarrhœa, which has constantly to be guarded against, and is, next to wet, the greatest peril of their early lives. The egg should be left off gradually, substituting some Spratt, or meal mixed with rice boiled in milk, with some kind of minced animal food or cut bone. Gradually a little grain may be added, but soft food should predominate for some weeks, and be given in fair proportion throughout. A rather favourite American diet is Indian-corn meal and curd made from sour milk, a little cracked corn, and wheat once a day. While penned up, it is better to give them in addition some chopped dandelion or lettuce leaves: the wild birds seem to prefer dandelion to all other green food, and there are no doubt reasons for this. The chicks much enjoy the minced leaves, and seem in general to thrive better with a supply of such salad besides their food; yet there are occasional exceptions to even this, and we remember one breeder writing that he never could give his chicks such green food without starting the dreaded diarrhœa, while he got along all right so long as he reared them without any till they could get it for themselves. We never could get at the reason for this; but any breeder would be foolish to disregard such experience, and there will always be an *individuality* about the birds on any given farm, which may require study and allowance of this kind.

Broadly and generally, however, in England most success will follow feeding as above, and cooping the hen under cover for three or four weeks, either in a very large roofed coop with a dry wooden floor, or under a shed. Where coops are used, in the open, it will be all the better to move them at intervals; and by degrees of course the food will be brought round to rougher diet, avoiding too "soft" or new grain as tending to looseness. We have more doubt about egg-food than in former years, and in case of any diarrhœa appearing, would omit it at once, substituting some Spratt mixed with rice boiled in milk, or even in water, but so as not to be too soft, and if necessary sprinkling on the food a little powdered chalk. Some still give chopped onions, but we think this a mistake.

By far the most important general rule, is to feed often, but to feed *sparingly*. Above almost all chickens, young turkeys require to be kept on the move, and to eat little at a time, and while walking about, so far as possible. Full feeding, of any kind, always upsets their digestive system before very long; and we suspect that such disasters as occur under the older methods of rearing have been far more often owing to either this cause, or to insect vermin, than to any other.

This latter pest must throughout be guarded against, and it is largely because American breeders have at last become so fully alive to it as a cause of weakness and death, that their results have so much improved over those of former years. The British climate is not so apt to encourage insects; still we have seen flocks of young birds obviously pining from this cause. Such should always be caught and examined, and if necessary energetically treated, either by using volatile insecticide in a large box, or by powdered sulphur or insect powder. One great advantage of the more open-air system is that it keeps the poults more free from this danger.

Another point to be borne in mind is that young turkeys, as indeed old ones also, specially require abundance of *grit*. Plenty of gravel or other grit should always be provided near their coop or shed, and it will be seen that they take a rather surprising quantity of it. Grit should also be well scattered over the grass near the coop. Some believe that coarsely crushed charcoal amongst the grit is an advantage: we can testify to its being eaten, at all events. With plenty of grit, and very *sparing* but frequent feeding upon good food, on clean ground, most of the supposed difficulties of rearing young turkeys will be found to disappear, and they will make even larger frames than if fed more freely. This kind of feeding is the more necessary because they are eager feeders, and if allowed to eat to repletion, suffer as above indicated.

Some American breeders mix a portion of red pepper in the food of the young birds, and believe them to do better with it. They state, that if allowed the chicks will attack pods of red pepper eagerly; and it is just possible that the old popular superstition of putting a peppercorn down the throat of each poult may have been originally based upon some such observation. The condiment prescription No. 2, given on page 199, may be of considerable service if used with discretion, giving it only to chicks that seem flagging, or on wet days. It is used by many turkey-raisers in France, for whom it was originally devised by a French chemist, who also raised turkeys himself, and who found its value in bringing his birds through the critical weeks before the "shooting of the red."

In America many turkeys get no feeding at all during the summer, after being turned loose; and many others only a feed of corn at night, given partly to supplement what they pick up, and partly to keep them in the habit of coming home: they make their growth on vegetable food and insects, and are found to be larger as well as more healthy in the fall. On English farms they would not often get enough in this way, though they will make splendid birds when allowed to run wild on unlimited space in park or covert. In some places it is still customary for large farmers to buy young birds from the smaller ones about the end of August, and turn them into the stubbles, where they can get plenty of food for some time; but this plan is less followed since other poultry are kept so much more largely upon the farms. As a rule English turkeys have to be regularly fed, and the best breeders continue some soft food till the poults are at least four months old, and even longer, though gradually more grain is given in proportion. Ground oats and skim milk, and whole white oats, make the whitest flesh, and turkeys thus fed present the best appearance; but in some districts this food would be too expensive. They ought not to be allowed to feed themselves really fat until the time for the final fattening approaches; such as fatten too early not being later on so fine in quality, and being seldom so fine in frame. The great object during the earlier months should be to keep in vigorous health and to make frame, towards which some cut bone is a great assistance.

About six to eight weeks old, when nearly feathered, the poults will begin to try to perch about on walls and fences, and should be encouraged, if at all convenient, to roost either in trees or on the beams of some open shed. They should not be crowded too many together, and as they grow up, should be sorted out a little, and those to be kept for stock taken out from the rest. Once having "shot the red" and got fairly started on their open-air life, they are extremely hardy as regards any weather, and no further anxiety need be felt on that score; if on the other hand shut up to roost in closed houses, there is likely to be a great deal of trouble from colds and "swelled head." This last complaint is the form in which loss most frequently occurs in rearing turkeys, and is doubtless the turkey form of catarrhal roup. The best treatment is to pen the birds in a large barn or shed with plenty of air, but no draughts, fomenting the heads with hot water in which poppy heads are infused, and giving either mild doses of Epsom salts, or almost any approved roup pills, but dividing these so as to give smaller doses not less than four times a day. This complaint usually occurs only in birds too much confined at night, scarcely ever attacking such as roost out of doors, or in a tall shed entirely open on one side to the weather. The other most usual trouble of intestinal irritation or diarrhœa has already been mentioned, together with the methods by which it can be warded off. In some places large flocks are still placed under the care of a boy, and driven some distance from their roosting place to any good foraging ground. If the space is ample this system pays very well, as the birds need little other feeding until the time for fattening arrives, but it only answers upon really wide and good range. It will be seen that circumstances and appropriate management may differ in many details which it is impossible to specify, but which intelligence will grasp and turn to account.

"Blackhead" in Turkeys.

A disease among turkeys that has ravaged whole flocks in Rhode Island (America) and adjoining districts, and which has occurred with disastrous results in Australia, is that known as Blackhead. So far, fortunately, the complaint has not troubled English rearers; but since importations of American stock are sometimes made into Great Britain, the importer of American turkeys should as a precautionary measure quarantine his newly-arrived birds. The name blackhead was given to the disease (scientifically known as *Infectious Entrohepatitis*), which originated in America, owing to the fact that at a certain stage the affected turkey's head turns quite black. About the year 1894 the disease spread with such alarming rapidity, and decimated so many large flocks, that Dr. Theobald Smith was requested by the United States Department of Agriculture to make investigations concerning it; and he subsequently reported that it was caused by protozoa, a low form of microscopic life. He likened the disease to amebic dysentery in the human subject, and stated that it is characterised by large sores in the ceca and liver.

Treating of the disease in a bulletin issued by the Rhode Island Experiment Station, Mr. Cooper Curtice says: "The majority of young poults die after a day or two of droopiness. Adults may droop longer, and pass into chronic stages of the disease. Refusal to eat and standing apart constitute late symptoms. When the disease in the cecum is slight, it is doubtful if the affected birds have diarrhœa, which is more or less present in other cases. In many of the older poults the droppings will be liquid and stained orange-yellow; this is the most characteristic symptom of all. . . . When yards are infected, two weeks will suffice for the ameba to kill very young poults, three weeks suffice for killing older ones, and scarcely a longer period is required for adults. . . . One point of interest to turkey-raisers is that the experiments show that four-fifths of the young poults exposed to infected yards die before they are six weeks old. . . . The amebæ are transmitted from diseased turkeys to others through the droppings, which contaminate the food with which they come in contact. Evidence obtained here indicates that the amebæ may also be carried by ordinary fowl, and may be transmitted by them to turkeys in the same manner. . . . The evidence at hand indicates that turkeys may contract blackhead disease at any time of life. While the disease is usually fatal upon the first infection, both poults and adults may contract it, recover, and finally die during another attack in a subsequent year. These facts seem to indicate that immunity is not acquired by previous disease nor by age. . . . The fact that the common hen rarely succumbs to the disease, but occasionally has it, demonstrates that she would be an admirable natural host for the parasite. Every fact so far learned adds a link to the circumstantial evidence that may convict her as a carrier of the disease organism. If this be the case, hens and turkeys should neither live together nor be near neighbours. . . . In despair the poultryman asks if there is not something he can give to cure the turkeys. There is as yet no known efficacious remedy, and there is probably no medicinal remedy discoverable which can be economically administered. . . . Although nostrums are wanted, and will be demanded by the breeder, his way to success will be in the eradication and prevention of the disease rather than in employing specific preparations from which only the holder of the formula and the dealers are likely to profit. . . . Since the blackhead disease seems to have been prevented in large part by dryness of the surroundings, it is apparent that sandy, well-drained lands afford better advantages for raising turkeys than the heavier, moist clay lands, and hence the former situations should be chosen. The turkey attendant should not attend the ordinary fowls unless he understands the danger of carrying infection to the turkeys, and provides against it. Above all, the turkeys should be kept away from the hen yards and farmhouse at all times, or, if this is impracticable, the ordinary fowl should be kept within fenced enclosures to which the turkeys can never gain access, and care should be taken not to have the turkeys near the boundaries of such enclosures by feeding them at such points."

On farms where blackhead has existed, the following measures are recommended to be adopted by Mr. G. Bradshaw, in a Farmers' Bulletin, issued by the New South Wales Department of Agriculture:—The liberal use of slaked lime in the yards previously occupied by the diseased turkeys. The following is a serviceable disinfectant: Crude carbolic acid, half a gallon; crude sulphuric acid, half a gallon. These two substances should be mixed in tubs or glass vessels. The sulphuric acid is very slowly added to the carbolic acid. During the mixing a large amount of heat is developed. The disinfecting power of the mixture is heightened, if the amount of heat is kept down, by placing the tub or glass vessel containing the carbolic acid in cold water while the sulphuric acid is being added. The resulting mixture is added to water in the ratio of 1 to 20. One gallon of mixed acids will thus furnish twenty-one gallons of a strong disinfecting solution, having a slightly milky appearance. It is quite corrosive, and care should be taken to protect the eyes from accidental splashing.

The houses, roosts, yards, and other places over which the turkeys have had access should receive one or two liberal douchings with the above, and rearing be not again attempted till six months after the last douching, and care should be exercised that new stock should come from unaffected yards.

Fattening Turkeys for Market.

As they approach full growth, turkeys are prepared for market in various ways. Those which have been well fed for growth and frame can be brought to the highest possible condition by merely confining them to somewhat smaller range, and feeding them freely twice a day on ground oats mixed with milk, with a full feed of whole oats at night. This is not a very general plan, but we can vouch for the excellence of the results. Some feeders add to the meal diet, carrots boiled in lard and sliced up; some give one meal of thick oatmeal porridge. In Norfolk the usual plan is to confine the fattening birds in a shed, or hovel walled with furze to keep the draught out while giving air, with peat moss or other clean litter pretty deep on the ground. A usual mixture for feeding is oatmeal, barley-meal, and Indian-meal in equal proportions, with house-scraps and boiled carrots and other vegetables, mixed with skim milk where this can be had, as it whitens the flesh. During the last fortnight some fat or suet rendered from butchers' scraps is often added to the meal. In some sheds two meals per day only are given, as with Sussex fowls, and the sheds kept in semi-darkness between meals, the birds being only let out for a few minutes before each feed to stretch their legs; in others they are allowed daylight, and fed oftener, say three times a day. Grit is always supplied freely, and the birds generally roost on perches, all on the same level at about thirty inches from the ground. Many excellent turkeys come to market which have never been confined at all, but simply fed well three times a day for some weeks before killing.

In Normandy a few birds are shut up, but not many. The usual plan there is to *cram* them every morning and evening, driving them out on to the pastures during the day. They are crammed with boluses composed of barley flour (*i.e.* most of the husk taken out) and potatoes, with some minced grass and a little bran—these are dipped in milk before being placed down the throats of the birds. One point in which Continental raisers surpass many in England, though the large British raisers also give attention to it, is in the grading or sizing of their produce. They contract to deliver so many birds of a definite average weight, and thus the dealer knows what he will be receiving when the time comes. Two or three fine birds among a dozen or two small ones never fetch their value; what impresses a London market salesman is the character of *the lot* as such, and far too little importance has been attached to this matter.

Turkeys are usually killed in England by dislocating the neck, and plucked while warm like Sussex fowls; the large wing feathers must be plucked quickly, or there is great difficulty in drawing them. Some people think the flesh is whiter and more delicate if the birds are bled, which is very usual in America and on the Continent; but this plan loses weight.

Exhibiting Turkeys.

Turkeys meant for exhibition should not be unduly fattened. The birds will of course have been selected carefully, both as regards the perfection of their plumage and large frames, since it is the apparent *size* of a turkey rather than mere weight which tells most in a pen. They should be fed carefully and systematically for this, but kept among their hardy surroundings till late in the season—after that they should be gradually accustomed to somewhat closer quarters, and be occasionally penned. They usually take to this discipline very well, being quite conscious of the admiration which they excite. As soon as confined, a portion of dandelion or lettuce should form part of their diet, and good sharp grit not be forgotten. The plumage of dark breeds will always be in good condition if the birds are healthy, and washing removes the wonderful gloss; only the heads and legs should therefore be cleansed. White birds must of course be dealt with according to circumstances; but, unlike fowls, even these are often clean enough to pass muster.

Crested turkeys have been mentioned by various naturalists; but all attempts to breed them true to this point having failed, the crests must be considered to be merely accidental sports. Various specimens of these have been found from time to time, and have been bred from, but have hitherto failed to produce any crested progeny. The experiment has been tried both by Mr. Simpson in America and by Mr. Tegetmeier in this country, but both gentlemen failed to produce even a trace of a crest. The crest, therefore, remains as an accidental "sport," and nothing more; though Temminck states that Madame Backer had a whole flock of crested turkeys in her aviary at the Hague.

Nearly all good shows have classes for turkeys; but where there is only one for each sex, it is almost useless to exhibit anything but the Bronze, though now and then we have seen a fine White come in for second or third prize. They used to be judged mainly by weight at Birmingham; but that is a thing of the past. The real or apparent size is, of course, of great importance, but mere excessive weight is not now encouraged, as it spoils the bird for breeding. Below is the standard of the Poultry Club for these birds.

GENERAL CHARACTERISTICS

Head. — Long and broad, and carunculated (covered with fleshy protuberances). *Beak :* Strong, curved, well set in the head. *Eyes :* Full. *Throat Wattle :* Large and pendent.

Neck.—Long, curving backward toward the tail, the top and most of the front carunculated.

Body.—Long, deep through the centre, and well rounded. *Breast :* Broad and full; the cock's beard long, bristling, and prominent. *Back :* Somewhat curving, rising from the neck to the centre and descending in a graceful curve to the tail. *Wings :* Large and powerful, carried well up and closely to the sides.

Tail.—Long and drooping, the end almost touching the ground.

Legs and Feet.—*Legs :* Long, stout, and strong. *Toes :* Straight and strong.

Weight.—Black cock, 27 lb.; hen, 18 lb. Bronze cock, 36 lb.; hen, 20 lb. White cock, 26 lb.; hen, 16 lb.

Carriage.—Stately and upright.

Plumage.—Hard and glossy.

COLOUR

THE BLACK

Beak : Dark horn or slate black. *Eyes :* Dark hazel. *Head* (including *Face, Jaws, Throat Wattle, and Caruncles*) *:* Brilliant red, changeable to blue-white. *Legs and Feet :* Dark lead or slate black.

Plumage.—Lustrous black.

THE BRONZE

Beak : Light horn at the tip and dark at the base. *Eyes and Head :* As in the Black. *Legs and Feet :* Black, approaching brown in young birds, of a pink hue or flesh in adults.

Plumage of the Cock.—*Neck :* Light brilliant bronze. *Beard :* Black. *Back :* Light brilliant bronze, each feather terminating in a narrow black band extending across the end. *Breast :* Dark brilliant bronze. *Body :* Black, shaded with bronze, but not so brilliant as that of the breast. *Wings :* Bows, black, with a brilliant bronze or green lustre; coverts, rich bronze, the feathers terminating in a wide black band, and forming a broad bronze band across the wings when folded, and separated from the primaries by a glossy black ribbon-like mark, formed by the ends of the coverts; primaries, black or dark brown, pencilled across with bars of white or grey, the more evenly and regularly the better; secondaries, similar to the primaries, the colours changing to a bronze brown as the middle of the back is approached, but with little admixture of white; an edging of white or brown on the primaries or secondaries is very objectionable. *Tail :* Dull black, each feather regularly pencilled with narrow bands of brown, ending in a broad black band with a wide edging of dull white or grey, the coverts dull black or dark brown, each feather regularly pencilled with narrow bands of brown, ending in a wide black and bronze band extending across the feather, with a wide edging of white or grey.

(NOTE: The more distinct the colours throughout the whole plumage, the better.)

Plumage of the Hen.—Similar to that of the cock (but not so brilliant nor so clearly defined) except an edging of white on the feathers of the back, breast, body, and wing-bows, the edging to be narrow in front and gradually widen as it approaches the rear.

THE WHITE

Beak : Pink or flesh. *Eyes and Head :* As in the Black. *Legs and Feet :* White or pink-white.

Plumage.—Pure white; cock's beard, deep black.

SCALE OF POINTS

Type	30
Colour	25
Weight	25
Head and wattle	10
Legs and feet	5
Condition	5
	100

Serious defects : Wry tail; crooked breast-bone; any deformity. In the Black: feathers of any other colour; cocks weighing less than 20 lb., and hens less than 12 lb. In the Bronze: white feathers in any part; wings clear black or brown, or minus white or grey bars more than one-half the length of the primaries; back, tail or tail coverts clear black, brown, or grey; cocks weighing less than 30 lb., and hens less than 18 lb. In the White: feathers of any other colour; legs other than white or pink-white; cocks weighing less than 20 lb., and hens less than 12 lb.

THE GUINEA FOWL.

Under the general head of Guinea fowls, or the genus *Numida*, naturalists have grouped many wild varieties; but the fact that all belong to some part of Africa, makes a common origin almost certain. Many of these sub-races have been crossed, and we believe in every case the progeny have proved fertile. Of these various races of Guinea fowls, some have a peculiar bony helmet on the top of the head; others have this replaced by a crest of feathers, the shape and size of which crest varies; and in a third section which appears to have more distinctiveness, there is neither crest nor helmet, and such a general resemblance to the vulture that the bird has been graphically termed the Vulturine Guinea Fowl.

Wild Varieties.

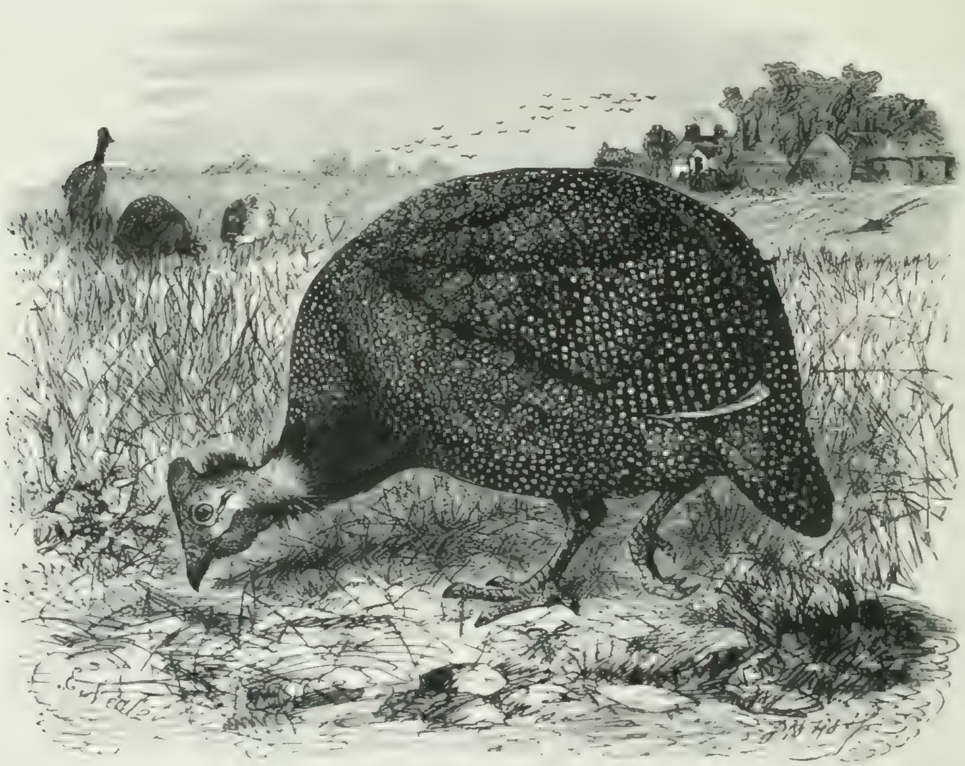
To the first or helmeted group belongs the common Guinea Fowl of West Africa, or *Numida meleagris*, long regarded as the original of our domestic race. Some authorities have objected to this view, on the ground that as the bird is admitted to have been known to the Romans, and they had more intercourse with the Egyptian side of the great African continent, one of the varieties common in Abyssinia is more likely to have been the original. It may have been so with the Roman birds; but in regard to the present European stock, not only is the name entitled to weight in a case of this kind, but at Bristol, which is a considerable centre of the West African trade, we have on many occasions seen Guinea fowls perched on the rigging of African vessels, brought from the coast by sailors; and in every case these birds were obviously identical with the domestic breed, both in head and plumage, being only somewhat slighter in build.

The wild crested varieties are chiefly found in Eastern and Central Africa, though one or two are known on the West Coast. They have black crests instead of the bony casque, the spots are blue instead of white, and the necks and wattles are more or less blue. Specimens are sometimes to be found at the Zoological Gardens in Regent's Park, London, and some have been so beautiful as to give interest to the probable prospect of their becoming better known with the opening up of Uganda.

The finest variety of Guinea fowls belongs to the class with neither helmet nor crest, and is known as the Royal Vulturine Guinea fowl. The neck and tail are very long in comparison with the common variety, and the other points have been described as follows: The head and upper part of the throat are destitute of feathers, the lower part of the neck ornamented with long, lanceolate, and flowing feathers, having a broad stripe of white down the centre, to which on each side succeeds a line of dull black, finely dotted with white, and margined with fine blue. The feathers of the inferior part of the back are of similar form, but broader, with a narrower line of white down the centre, and with the minute white dots disposed in irregular and obliquely transverse lines. The wing-coverts, back, rump, tail, under tail-coverts, and thighs, are blackish brown, ornamented with numerous spots of white surrounded by circles of black, the intermediate spaces being filled by very minute spots of white; the primaries are brown, with light shafts and spots of brownish white on the outer web; the secondaries brownish black on the tips, with three imperfect lines of white disposed lengthwise on the outer web, and three rows of spots of white on the inner web; the breast and sides of the abdomen are of a beautiful metallic blue, the centre of the abdomen black, the flanks dull pink, with numerous spots of white surrounded by circles of black. Mr. Gould writes of this magnificent variety of Guinea fowl: "It is certainly one of the most noble birds that has been discovered for some years." It is the long neck adorned with lanceolate feathers, the absence of casque or crest, and the long tail and legs, which give it so strange a resemblance to the vulture. It has been introduced into one or two menageries; but appears more delicate in cold situations than any of the preceding kinds.

As a rule the common Guinea fowl is very uniform in colour, the wattles being red, the neck bare near the head, with a great deal of white about it and a thin mane of bristles behind, and the general plumage marked with small round white spots all over a very dark purplish grey ground. Variations do, however, occur in a state of domestication. In some birds the spots have almost disappeared: in a few the colour is reversed, the spots being dark and the ground-colour light grey: quite white birds are also known (Ellis mentions white ones in Madagascar); and from crosses of these last, pied fowls have been produced. The birds are smaller than they appear, rarely weighing more than 3½ lbs.; but the bones are small and fine also. The flesh is dark, but very delicate, and of a gamey flavour: for this reason the birds are most in demand about February or March, when game is going out, and spring chickens are scarce and dear. At this season from 5s. to 7s. per couple is sometimes realised for plump birds, but the demand so far has been limited: possibly it might be increased by a regular supply.

But for this limited demand, Guinea Fowls would be very profitable poultry in some localities, being best of all adapted to the "let alone" system on a farm, where they will find nearly all their own living, laying about seventy eggs a year, and devouring more insects than any other poultry, for practically no cost in food. But there is at present no great market for them; and their eggs are small, and very apt to be laid away and get either lost or stale in such circumstances. The cocks are also very pugnacious with other poultry, driving them away from their food. Given, however, any steady demand for young birds, Guinea fowls will pay very well indeed. It should perhaps be remarked, that while generally most saleable at the season above mentioned, they are really more delicious and tender if eaten in late autumn and winter, when they are younger. Birds eaten then, of course, save their keep through the winter; but though a delicious dish at home, at that time of year there is little market demand for such small birds.


The Common Guinea Fowl.

Breeding Guinea Fowls.

A stock of Guinea fowls should be commenced from eggs, not from purchased birds, and these should be hatched under hens, when they grow up much more tame. The normal time for hatching is twenty-six days, extending sometimes to twenty-eight days. The chicks are small, and rather delicate as regards damp; and having very small crops, require feeding not less than six times a day. Until they can roam about, they require a fair proportion of animal food, and plenty of succulent green food. They should at first be confined to a small wired grass-run, shifted every two days, or they may run away and get lost. After they are large and strong enough to range about, they require little feeding. This should be given them with the other fowls, when they will come back to the yard at night; and if the fowl-house is large and lofty, or, still better, if a large and lofty one can be given up to them, with high perches, they are readily taught to roost at home.

The wild bird is monogamous; in domestication two hens may be allowed to each cock; more than this sometimes succeeds, but nearly as often fails. The cock closely resembles the hen, but is generally slightly larger, has larger wattles, his voice is a more shrill shriek instead of the female's well-known "come-back" note, and he has a peculiar habit of strutting on tip-toe, and arching his back. The hen begins to lay from the end of March in very warm spring seasons, to the middle of May in colder ones, and seldom lays less than sixty eggs, going occasionally as high as over a hundred, according to the locality and supply of insect food: she continues till about the end of August. This supposes them to roost in a house, which they prefer to do in really bad weather, and if brought up to it. The eggs are rather small, with pointed ends, of a very rich colour and fine flavour; and if collected fresh, sometimes find a good and regular market at first-class shops, packed in dozen baskets with a little moss, like the eggs of some game birds. Of course the earlier eggs, in April and early May, should be used for breeding, and the Guinea hen herself seldom becomes broody till late in summer, if the eggs are gathered daily, leaving only one in the nest. If they are to lay in the house, some pains should be spent, as with turkeys, to arrange nests which are not only secluded, but look naturally so: otherwise care must be taken to regularly visit all likely places about the farm.

All writers have noticed the good qualities of Guinea fowls as night-guards. No strange person or noise escapes them; and then their screaming is not only effectual, but calculated of itself to frighten off any evilly disposed marauder.

The common Guinea fowl is now found wild in the Cape de Verde Islands, and also in Jamaica, to both of which there is no doubt it was taken from Africa. Any covert, in a fairly warm and dry locality, can be readily "swarmed" with them, and they then become very wild and shy; hence many attempts have been made to utilise them as game birds. Such attempts have, however, always had to be given up, as the Guinea fowls displaced all other game from the covert, while themselves, as Mr. Hewitt wrote us long ago, running before dogs like a corn-crake, and hence affording no sport. They are essentially mere domestic poultry, but suitable only for certain markets and circumstances.

Hybrids have occurred between the Guinea fowl and common poultry: we knew of one with a Dark Brahma hen. The progeny in all such cases is of course very wild and perfectly sterile. The Guinea cock has also been known to cross with small turkey hens occasionally. None of these results are of any practical interest.

THE PEA FOWL.

If the references to the peacock in the two parallel passages of Scripture, 1 Kings x. 22 and 2 Chron. ix. 21,* are correct translations of the Hebrew *Tūkiyyīm*, the bird has been known from the earliest times; and the question invests the pea fowl with a Biblical, historical, and geographical interest greater than can be attached to any other bird, since upon its answer depends the destination of Solomon's voyages, and the locality of that Ophir to which they are said to have been directed. As every one of the various products named in these verses except the *Tūkiyyīm* could have been obtained from either Arabia, Africa, or India, the whole of this interesting question almost entirely depends upon what creature is meant by the Hebrew word. This word has been supposed by Hebrew scholars to be derived from a foreign root, signifying "tufted," or "crested"; and although the Peacock is crested, it has been objected that the crest is far from being so conspicuous a characteristic as the gorgeous plumes. Hence a crested parrot has been conjectured by those who would place Ophir in Africa; but it does not appear that the ancients were acquainted with parrots, and much less with any crested parrot, till long after. Besides other indications, however, which may point to Ophir being in the East Indies, the natives of Malacca still call their gold mines *ophirs* (De Poivre); and in Malabar the peacock is still called *Togei*, and in one of the Indian dialects, *Tikki*, which word furnishes a very probable origin for the Hebrew *Tūkiyyīm*, and seems to show that the name was brought along with the bird to which it belonged, from the place of origin. In such a case this is very likely to have occurred; that such a gorgeous bird should be sought for and valued by a magnificent monarch like Solomon, who is expressly stated to have taken special interest in natural history, is highly probable; and on all these grounds, it is considered far the most likely that Solomon really was nearly or quite the first to import this beautiful bird from the East, and that some southern region of the Indies was the locality from which both it and the other precious products enumerated were procured. If such conclusions be correct, it will be observed that they clearly point to Solomon as *the first importer of fancy poultry*, and, singularly enough, from the very same region whence the most striking of our own more modern varieties have been obtained.

The pea fowl, as will be gathered from the preceding paragraphs, is found exclusively in Eastern Asia, in which it has, however, a pretty wide range, extending through part of China, the whole of India, and the adjacent islands. It is found in three natural or wild varieties.

The common pea fowl (*Pavo cristatus*) is so well known as scarcely to need description.

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* The passage in Job xxxix. 13 has an entirely different word, which probably refers to the ostrich.

Varieties of Pea Fowl.

The head, neck, and breast of the male are a rich purple, with beautiful blue reflections, the head having an aigrette or crest composed of twenty-four feathers, which are only webbed at the tip, where they show blue and green reflections. The back is green, with a copper-coloured lacing to the feathers; the wings whitish, striped or barred with black, gradually shading into deep blue. The primaries and true tail-feathers are a dark rich chestnut; but the feathers of the train are glossy green, ocellated at the tips. These feathers, commonly called the "tail," are not really tail-feathers, but *tail-coverts*, springing from the back, the true tail being under them, and serving to support them when erected. The thighs are generally greyish, and the belly and rump black. The eyes are dark hazel, pearled round the edges, and legs brown, spurred as in the common fowl. The neck is very long, slender, and snaky, and the head small in proportion to the body. The female is much more subdued in colour, being of a prevailing chestnut brown, variously shaded on different parts of the body, and mottled or shaded in places, especially about the wings and tail, with dull or greyish white. She has a crest like the male, but duller in colour and not so tall. This variety is common throughout India, Ceylon, and the adjacent islands. In some parts of India Peacock-shooting is a recognised sport; while in others, and in some parts of Ceylon, the birds are so plentiful as to be cared little about. Colonel Williamson writes: "In the Jungleterry districts, I have seen such quantities of pea fowl as have absolutely surprised me. Whole woods were covered with their beautiful plumage, to which a rising sun imparted additional brilliancy, and I speak within bounds when I assert that there could not be less than twelve or fifteen hundred peafowl of various sizes within sight of the spot where I stood for nearly an hour." He also mentions the curious fact that wherever Peacocks abound the tiger is generally found also more near than convenient, so that Peacock-shooting is by no means devoid of danger.

The Japanese Peacock (*Pavo muticus*) differs considerably in colour and some other points from the ordinary bird. The crest on the head is nearly twice as long, and the feathers of which it is composed are also webbed or barbed from their bases, instead of only at the tips. The colour of the neck is a glossy green, margined or laced with coppery gold, and arranged not as ordinary neck-feathers in most birds, but like the scales of a fish. The metallic gloss is extraordinary, and far superior to that on the other variety. On the back, which is a rich copper-bronze marked with bars of green and light brown, this lustre is still more conspicuous. The shoulder-coverts resemble those of the common bird, but are a deeper and more intense blue; the tail-coverts or train are rich green, barred across, or shot with gold and copper-bronze reflections. In the breeding season, which commences about March, these barred feathers are replaced by other ocellated plumes, resembling those of the Common Peacock, but with more bronze. The hen is sober in colour, much like the preceding variety. This magnificent Peacock inhabits Burmah, Siam, Java, Sumatra, and Japan, but is believed not to be found in India. The two kinds breed freely, however, and the progeny is fertile.

The Black-Winged Peacock (*Pavo nigripennis*), was believed by Dr. Sclater* to be a distinct species, on the ground that it propagates true to points. It differs from the Common Peacock chiefly in the dark colour of the wings, from which it takes its name, but the thighs are also of the same dark tint; the hens, on the contrary, are almost white, with dark tails. Mr. Darwin has, however, shown almost conclusively that it is merely a "sport" from the Common, which has been recorded on many occasions, and is probably due to domestication. To the same cause are due the white and pied sports occasionally seen.

Domestic Pea Fowl.

Pea fowl are so rarely thought of now as table poultry, that it is remarkable how most historical notices of the bird are from a gastronomic point of view. A favourite dish of Vitellius was partly composed of the brains of Peacocks; and Columella gives full directions for their management. In 1254 Henry III. offered a Peacock as a prize for "running at the quintain." The whole bird was considered a dainty dish, and a "pecok enhakyll" (meaning with the train-feathers) is named by Fabian as one of the dishes at the wedding-feast of Henry VI. From a curious old MS. in the Library of the Royal Society, we quote the recipe for this noble dish, as follows: "For a feste royal, pecokkes schol be dight on this manere: Take and flee off the skynne, with the fedures, tayle, and the neck and head thereon. Then take the skynne and all the fedures, and lay it on a tabel abrode, and straw thereon grounden comyn. Then take the pecok and roste hym, and endore him with

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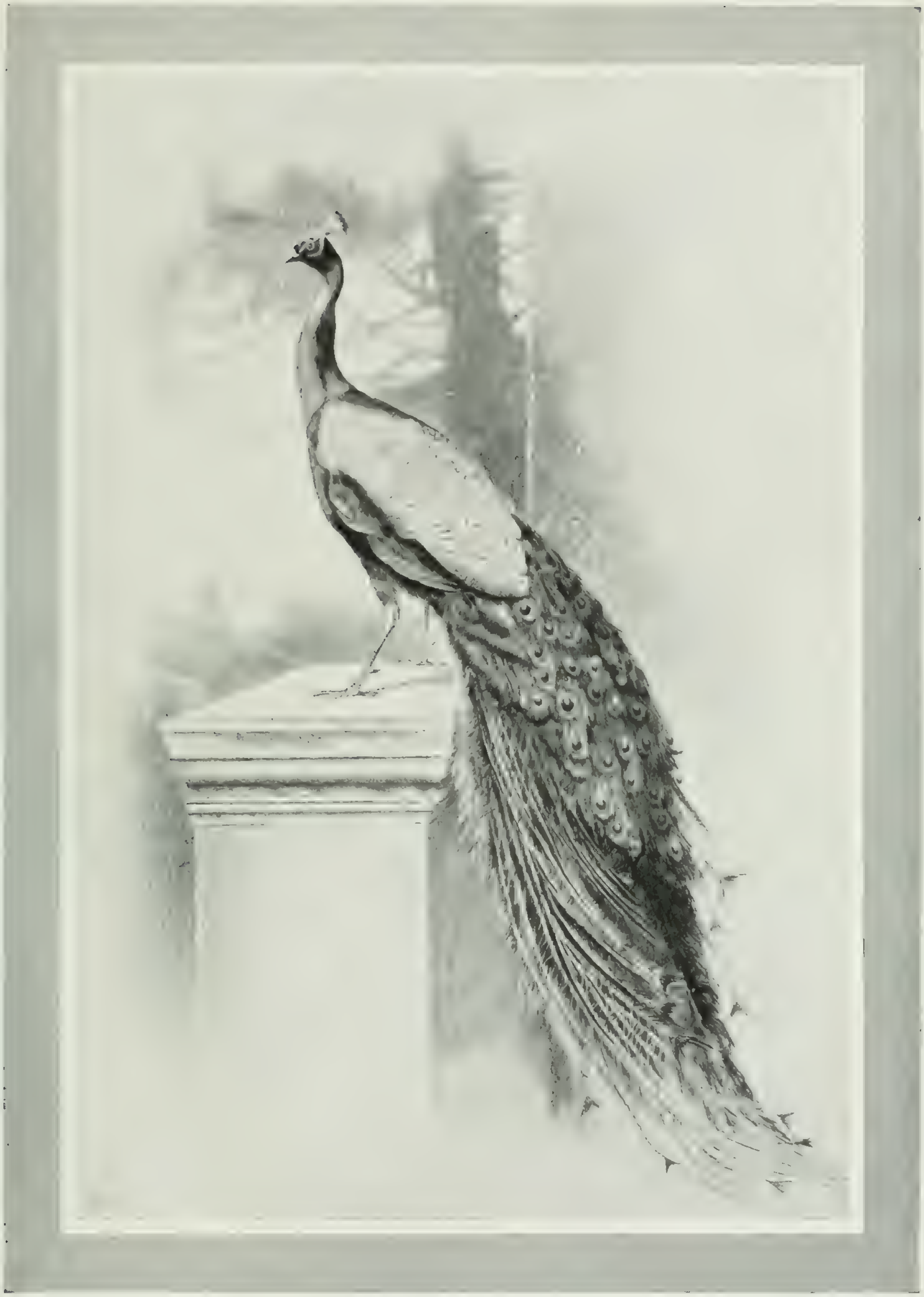
* "Proceedings of Zoological Society," April 24th, 1860



Peacock.

rawe yolkes of eggs; and when he is rosted take hym off and let hym cole a whyle, and take and sowe hym in his skynne, and gild his combe, and so serve him forthe with the last cours." According to the old play by Massinger, called *The City Madam*, "The carcases of three fat wethers were bruised for gravy to make sauce for a single peacock"; and it is plain enough that the royal bird was the principal dish of the course. A young pea fowl of either sex is, in fact, as delicious eating as can possibly be.

But it is on the lawn, in the park, or in a public garden that the Peacock finds its proper place and displays its full beauty. It can be confined in wire pens like the Pheasant; but unless these are very large, and well furnished with shrubbery, it seldom breeds well in such confinement, though some restriction is advisable at first, while domesticating birds in a new home. They do best where they can make their own nests in a shrubbery, or piece of long grass left for them, and can roost in the trees. When settled down they will range round the house, but generally stay near it, and if regularly fed become very tame, tapping at the window and calling if their morning feed is delayed. Where not regularly fed, they wander much farther, and may get lost. When full grown, they may have mash in the morning and corn at night, like other poultry, but practically will eat anything that is at all eatable. They are long-lived, and have been recorded as reaching the age of thirty years.

The wild bird is polygamous, and should not have less than three hens, if possible, up to as many as six being quite permissible. They are spiteful and quarrelsome among other poultry, and the cock will sometimes not only kill, but eat, newly hatched chicks, if he has the opportunity. Some cocks have been known to attack children; but this is very unusual, and they usually are very tame as regards human beings. They are not of full age, as regards either size, or plumage, or fitness for breeding, till two years old, and should not be mated before. The hen may begin to lay in March, or more probably April, and is the best mother for her own chicks, as she goes all the rest of the year with them, and they need this long protection; on this account it does not answer to set the eggs under hens, which leave them before they can bear it. The number of eggs usually laid is eight or ten, sometimes more. The nest of a hen should never be disturbed, but when she leaves it—which she usually proclaims by a shrill cry—food and water should be given promptly. The period of incubation varies from twenty-eight to thirty days. The young chicks are delicate as regards wet and wind, but should be allowed to run about on dry soil, and be given, if possible, some ants' eggs, worms, or other live animal food, besides Spratt and oatmeal mixed with milk. They will soon come on to grain of different kinds, and be reared afterwards with little trouble. On damp soil they should not be attempted. The hen will take care of them till about February, when she beats them off at pairing time.

Pea fowl moult fast, and the cock especially seems to droop more than other poultry, owing no doubt to the immense amount of feather which he has to renew. The birds at this time seek the deepest seclusion they can find, and should be allowed it, providing nourishing diet for them in proper places. If all goes well, the moult is soon over, and they are all right again. The male's plumes do not reach their full size and beauty till the third season.

Within the last few years there has been a rather curious demand for Peacock feathers to be sold for use (or abuse) as "ticklers" during crowded rejoicings. The object cannot be commended, and, indeed, it is to be hoped may be hindered by the police; but this odd and novel market has had the effect of perceptibly developing Peacock breeding in France in order to supply it. Some of this has been carried on upon ordinary lines; but we are informed that several breeders have kept the birds in large pens to produce the eggs, which are hatched in incubators, and the chicks reared artificially. By artificial brooders the continued shelter which hens fail to afford can be given to the chicks; and, so far as the method has been carried, it is stated to answer very well.

CHAPTER XXXVII.

DUCKS AND ORNAMENTAL WATERFOWL.

WITH perhaps one exception (the Muscovy) the whole of the "farm" breeds of ducks, and many of the others also, are descended from the Wild duck or Mallard (*Anas boschas*), which is distributed more widely than perhaps any other bird over the entire continent of Europe and a great part of North America. Its range extends from the vicinity of the pole in summer, to almost the torrid zone in winter, the bird migrating regularly towards the south on the approach of cold weather, and returning with the summer to northern regions. In the more southerly countries it is a less frequent visitor, the temperate latitudes being its favourite home; but it has been known to reach North Africa during its winter migrations. Italy, Greece, and Spain are however its most favourite winter quarters. The colour of the Mallard resembles generally that of the Rouen duck; the shape is, however, more slender and upright, and the habits much more active.

Every year a singular change takes place in the plumage of the Mallard drake, which, as it is common not only to the Rouen, but to nearly all varieties of ducks in which the plumage of the male greatly differs from that of the female, deserves special notice. It is described by Waterton as follows: "About the 24th of May the breast and back of the drake exhibit the first appearance of a change of colour. In a few days after this the curled feathers above the tail drop out, and grey feathers begin to appear amongst the lovely green plumage which surrounds the eyes. Every succeeding day now begins marks of rapid change. By the 23rd of June scarcely one green feather is to be seen on the head and neck of the bird. By the 6th of July every feather of the former brilliant plumage has disappeared, and the male has received a garb like that of the female, though of a somewhat darker tint. In the early part of August this new plumage begins to drop off gradually, and by the 10th of October the drake will appear again in all his rich magnificence of dress, than which scarcely anything throughout the whole wide field of nature can be seen more lovely, or better arranged to charm the eye of man." The dates mentioned are of course subject to some variation, as Waterton observes, especially with domesticated and other breeds.

Marshes and fens are the chief resorts of the Wild duck; and drainage and other forms of cultivation have now driven it away from many an old haunt where it formerly was a regular visitant. To others, however, it still comes in large numbers, and is taken in various species of decoys, or shot by hundreds, especially in Lincolnshire. About March it pairs, the wild bird being strictly monogamous. The duck usually lays from seven to ten eggs, making her nest of flags or sedges somewhere near the water. She sits for twenty-eight days, and the same period is common to all her various descendants except some of the smaller varieties, which, like Bantams among fowls, often hatch in somewhat less. She sits with great steadiness, and on leaving the nest always covers her eggs carefully over with leaves and grass. As soon as the duck begins to sit, the drake leaves her, and joining the others, begins the curious moult described. Later on, when the young are partly grown, the male rejoins his family, and several unite to form one flock. They then remain together till the autumn, when the whole colony fly in consort to their warmer winter quarters. During this migration they generally fly in long lines in the shape of the letter **V**, a mode of flying which is more or less common to all the waterfowl.

Wild ducks have often been domesticated, eggs being taken and hatched under tame ducks or hens, when they are brought up with no difficulty, though of course there is some wildness of disposition. It is found that, down to about the third and sometimes the fourth generation, domesticated wild drakes pair strictly like their ancestors, instead of taking a small harem like the domestic varieties. When thus domesticated, however, the progeny after a while almost always begins to vary in colour, showing in this way the origin of our domestic races.

In treating these, it will be most convenient to devote a few lines first to general habits and management; then to describe the principal breeds which are exhibited and used for market purposes, and the methods chiefly used in supplying the markets with this class of poultry; and finally to give such short account as space will permit of the best known amongst those exquisite varieties occasionally seen at shows or on ornamental waters, and some of which are among the most beautiful in plumage of all the feathered tribes.

General Management of Ducks.

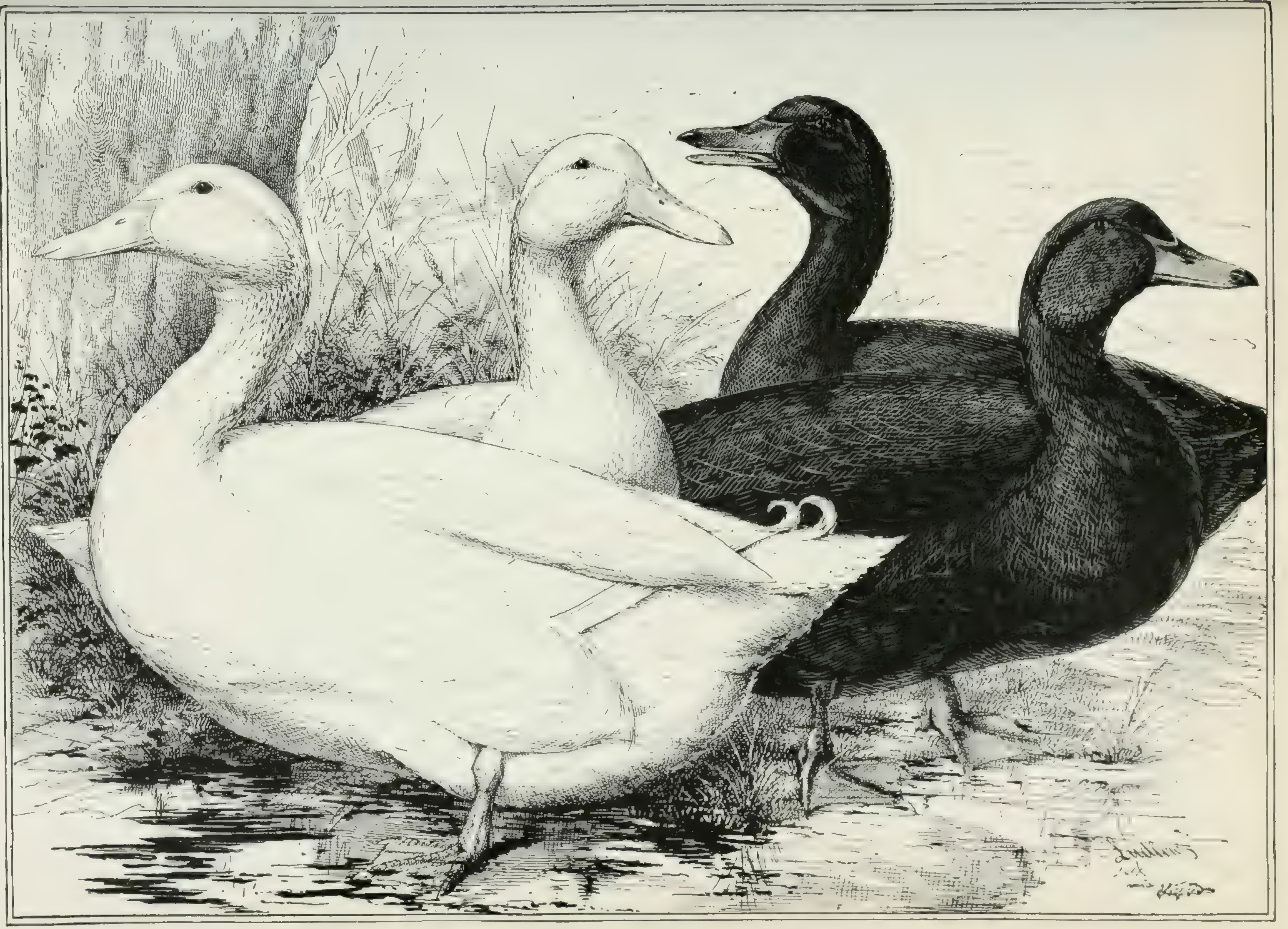
The house for a single pen of ducks need only be a few feet square, and may be as freely ventilated as desired, so that it is needless to be particular about stopping every crack in the walls: the more air they have the better. The roof should be tight, however, and the chief requisite of all is a dry floor, as the birds get cramp very quickly if this is not attended to. The best floor for a duck-house is concrete, sloping a little from the place where the birds sleep; another good plan is to make a floor of slats raised two or three inches above the ground, with half an inch of space between the slats. On the floor dry straw is laid, on which they sleep, and which must be renewed wholly or in part whenever it is found wet or dirty. A few bricks on the floor make as good nests as anything, and some prefer none at all, the ducks laying in the loose straw. It is generally the best plan to shut laying ducks in the house till nine or ten o'clock in the morning (they usually lay early, and sometimes before light) as otherwise they are apt to lay away anywhere, or even in the water whilst swimming.

Though most of the ducklings reared for market have never entered water in their lives, breeding and exhibition stock require water, in which copulation often takes place, and without which the eggs are not fertile as a general rule, though "dry" rearing in the United States has produced strains that breed satisfactorily even if not allowed to swim, and some dry-reared ducks are found fertile in England also. Where there is good range over farm or garden, however, quite a small pond made of concrete, or by sinking an iron cistern in the ground, will suffice. A pen of ducks thus kept is useful in a garden, eating many slugs and worms, and doing little damage if fenced away from strawberries, of which they are specially fond. A foot of wire netting is quite sufficient to confine them anywhere, or a board stood up on its edge will do the same.

It is usual to mate three or four ducks to one drake, and the eggs are generally fertile, except that the first dozen eggs which a duck lays are very often not so. The birds are almost always peaceable, and several pens will agree perfectly well together. With good range, stock birds do not require much feeding, as they pick up a great deal in the water in the shape of small molluscs, animalcula, and weed, and also from the ground in the way of snails, slugs, and worms; in such circumstances a little meal in the morning and grain in the evening will suffice. When kept in smaller space more food is required, and amongst this a portion of *animal* food is absolutely necessary, far more so than in the case of fowls, as nature intends them to obtain a great deal of this description of food, and without it they cannot thrive, much less keep up a supply of eggs. Plenty of grit must also be provided in such circumstances, some being also placed in the trough of water.

A few ducks may be kept with profit, either as providers of eggs, or of young birds. Where ducklings are chiefly valued, the Aylesbury or Pekin will generally pay best, or a cross between the two; where eggs are most desired, Pekins or Indian Runners of good strains will lay as many eggs in a year as the laying breeds of fowls; or one of the Campbell varieties will be useful. The young are much more easily reared than chickens, having unfailing appetites, and growing much faster, so that they are eatable at a much earlier age. The eggs are much better set under hens as a rule, and if the duck be placed in a pen by herself for a few days, her broody fit will go off and she will soon lay again. It should be mentioned that duck eggs are very often covered with a sort of slime when laid (sometimes of quite a different colour from the shell beneath), which, if left on, sometimes hardens the shell so much as to hinder hatching; if this is apparent it should be wiped off, either at once, or before incubation, where the eggs are intended for that purpose.

If a cosy house and bedding be provided for the night, one hen can look after a very large brood, the ducklings keeping themselves warm with much less brooding in comparison than chickens. They are generally fed mainly on one part of chopped hard-boiled egg mixed with two parts of stale bread-crumb, for the first five or six days, giving the food on a board about every two hours, and adding twice daily some green vegetables or weed chopped up, of which they prefer lettuce to anything else. A sod of turf may also be placed in front of the coop when there is no grass run, of which they will swallow a great deal of the earthy part as well as of the green. Later on coarser grit must be supplied, as for the old birds. After a few days the egg and bread may be replaced by Spratt and barleymeal, with which must be mixed a fair portion of some animal food—it matters little what—soaked dry meat or crissel,



AYLESBURY DUCKS. CAYUGA DUCKS.

boiled greaves chopped up, horse-flesh, or any wholesome butcher's refuse, or a portion of fresh-cut bone—any of these will suffice; but, as already explained, a fair proportion of such food is absolutely necessary for rearing fine or healthy ducklings. At a month old the five or six daily feeds may come down to four, and at six or seven weeks to three, leaving, however, in their sleeping place, but not near their bed, some grain in a shallow pan of water. They will thrive just as well (if not better) hatched in an incubator and reared in a brooder; but food must on no account ever be given in the inner chamber, which must be kept clean and dry.

A few ducklings may be reared even for exhibition in quite a small space, if it includes an exercise yard, and a small pond. The best time for hatching exhibition stock is March or April. Those which promise best, either for this purpose or as breeding stock, should be picked out when a few weeks old, kept specially clean and dry at night, and given all the exercise possible, feeding mainly for frame, with nitrogenous food, and after three weeks old allowing them to dabble in a large tin of water kept indoors, if the pond outside is too cold The remainder, which are only destined for table, may be kept penned up, and forced on with more fattening diet, on the same principles as described presently in connection with larger undertakings. Care must be taken to keep all out of the hot sun, which produces in ducklings a kind of sunstroke or heat apoplexy, and kills many if exposed to it, besides spoiling the bill in the case of Aylesburys. They also catch cold and cramp readily, if left out in a shower of rain before they are fledged, or allowed in cold water too early. In nature, the duck takes them to water at once, and the skin at once gets hardened to it: but with a hen or incubator, and at earlier seasons, this is not so, and they get chilled.

Aylesbury Ducks.

The domestic varieties of ducks are much more numerous than in 1861, when Mrs. Fergusson Blair wrote in *The Henwife* that "there is not a great variety in our domestic ducks; only three distinct exhibition breeds exist, viz. the Aylesbury, Rouen, and Buenos Ayres or East Indian." Though, curiously enough, the last-named has now practically disappeared, being replaced by the Cayuga, the list now would be twice as long; but the first place, at least in England, must still be given to the Aylesbury breed, named from the county town of Bucks, which has for generations been the chief, and is still the largest centre of the duck-rearing industry, and where scarcely any other kind of duck is thought of in connection with it.

The Aylesbury duck is long in the body, which is carried horizontally, the legs appearing almost in the middle. The neck is fine and rather long, with a somewhat swan-like carriage, the head a little snaky, with the bill long and coming out straight like a woodcock's. The most obvious characteristics to catch the eye are the pure and spotless white of the plumage, entirely free from the least yellow, which may contaminate Pekin-crossed birds, and the delicate colour of the bill, which should be a pale soft pink, "like that of a lady's finger-nail." This colour is partly the result of long and careful breeding; but there appears little doubt that it is partly due also to constant scouring in a fine shelly gravel found throughout the Vale of Aylesbury about the streams and ponds, of which the ducks are very fond; and it is only found in perfection when the birds are kept out of much sun, and away from ferruginous soil or foul water, which injures the colour greatly. Left to wander at pleasure in other localities, the progeny of the best stock will often turn yellow in the bill, but it is found that this can be prevented by care, and by placing in their troughs abundance of fine white sharp gravel. The legs are bright orange. The drake differs in no respect from the duck, except in being rather larger, and having two or three curled feathers in his tail; and at an early age it is difficult to distinguish the sexes, as these male feathers do not develop till the first moult. As the young ones grow to the age of six or eight weeks, however, the voice of the two sexes will be found to differ, the ducks giving a distinct "quack," whilst the note of the drake is not a quack at all, but much fainter, and husky in character.

In one respect the Aylesbury duck has somewhat changed during recent years. As we remember it in 1860, and for some years afterwards, it was not what duck-breeders term "keeled" underneath the body. By degrees this character was more and more cultivated, from a desire to increase the massive look of the birds, and at the present day the Standard describes and requires keel—the term is self-explanatory—in exhibition birds. To a certain moderate extent, while confined to a fairly deep breast-bone, the point is useful; but the present exaggerated keel is disliked by market dealers, and has had something to do with a partial displacement of Aylesbury ducks by Pekins in the London market The average weight of good stock is about 7 lbs. for drakes and 6 lbs. for ducks, in ordinary condition at twelve months old; and such weights, if of large frame, are quite large enough to breed from. The heavy weights of 10 lbs. and 9 lbs. seen at exhibitions are obtained by forcing diet; and birds once fed and fattened up to it are practically worthless as breeding stock afterwards. As if that were not enough, both these and other ducks are often *crammed* before judging, or tempted to eat a pound or more of raw sausages, or meat; or some exhibitors even provide a quantity of live worms! Some ducks have been killed in this way, but a moderate quantity of uncooked sausage, or something of the same kind, often seems to pick up the birds and make them look better in every way after the journey.

The bills of Aylesbury ducks kept for exhibition require much care. If a bird with the best of bills is allowed to grub about in filthy places after the manner of its tribe, and be shut up at night uncleansed, a very few days will discolour it; and a very few days of hot sun will tan it perceptibly yellow. Show birds should only be let out for an hour or two in morning and evening, though the breeders must have liberty even at the cost of tanning their bills, or the eggs will fail. The houses must be kept clean, and a pan of sharp white gravel and water always kept in it, with some wheat to induce them to scour in it freely. A young bill is thus kept in order, but with age a coarse, horny substance forms upon it, especially on a bird with much liberty. Before exhibition this is very carefully pared away with a sharp knife, taking care not to trench upon the inner skin or make it bleed. The bill is then smoothed with fine sandpaper, and the duck kept in a darkish house or pen for two or three weeks, with the gravel and wheat above mentioned. This will bring out a really good bill nearly as fresh as ever. The bills of other varieties sometimes need similar attention, though in less degree.

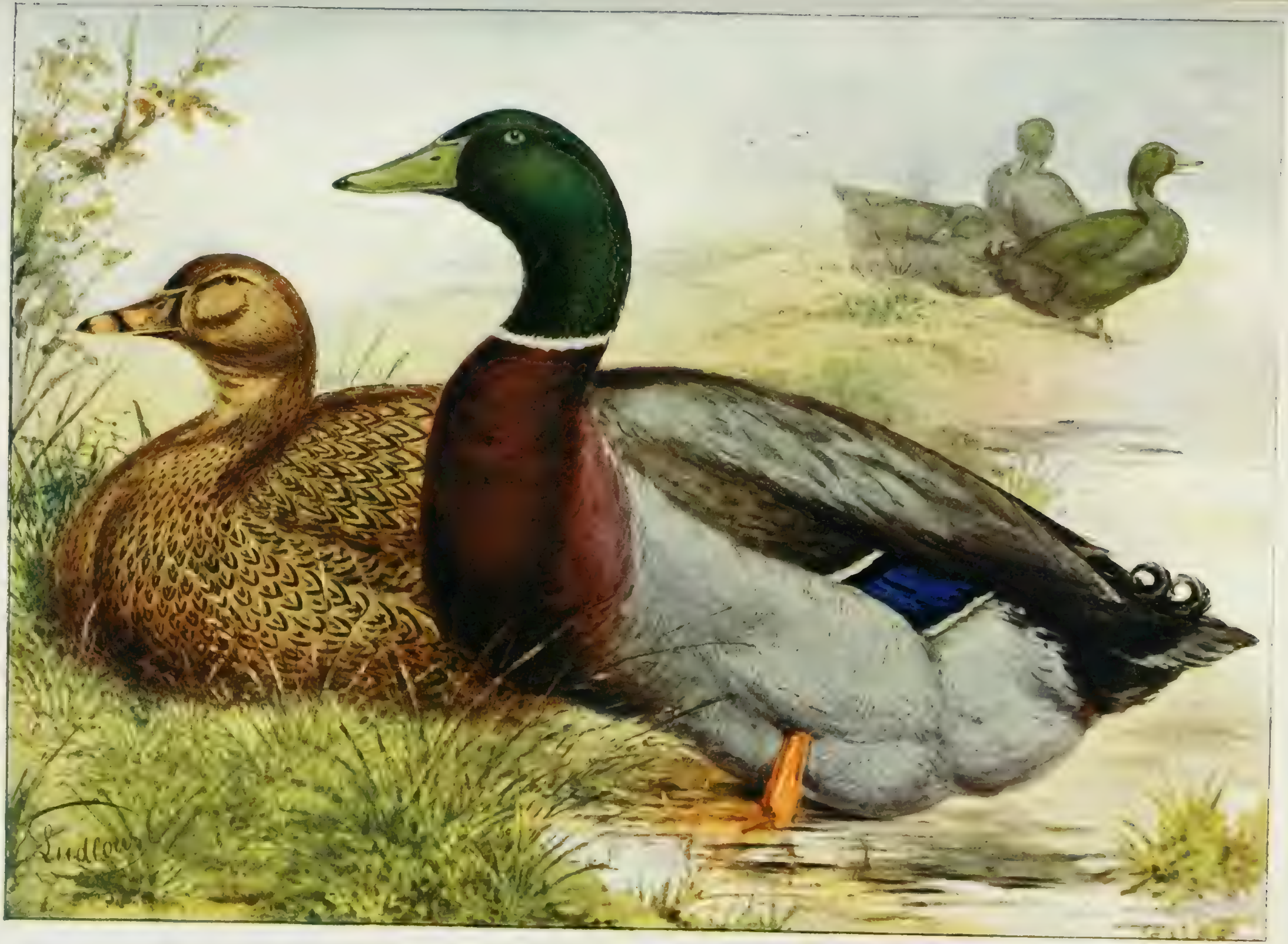
The special economic merits of the Aylesbury duck are its size, its hardiness in all climates, and above all its rapid and early maturity. Owing to this quality of quick and early growth, many are marketed at eight weeks old, and some weigh as much as 4 lbs. at that age. The white feathers are also of more value than coloured ones. The colour of the eggs varies. Most generally they are rather long and pointed, and white, of a peculiarly pearly or transparent quality, but others are green, and the same duck will even lay eggs of one colour and then of the other. Cream-coloured eggs are also not at all uncommon. The eggs are thought by many, more delicate in flavour than those of other breeds. The ducklings when hatched are a bright primrose yellow.

Rouen Ducks.

The Rouen duck closely resembles the wild Mallard in its plumage, except that this has been bred darker and richer. It is very probably correctly named from the city of Rouen, as ducks more or less resembling it in colour are still plentiful in Normandy, though not bred to such a precise standard of feather, or so massive. In general conformation the Rouen is somewhat shorter and deeper in body than the Aylesbury, and considerably deeper in keel. The bill should be long and broad and straight, as in that breed, that of the duck, however, being rather shorter than the drake's. The drake's bill should be a greenish yellow with a black bean at the tip, lead-colour amounting to disqualification, and too bright a yellow being also disliked. The head is a rich green, glossed with purple, which extends down the neck to a collar of pure white; this does not quite meet at the back, but must be clear and distinct so far as it goes. The breast is a rich deep claret extending down well below the water-line, and free from the fine white lacing which is called by breeders "chain armour." There it joins the delicate French grey of the flanks and under parts, which should extend to under the tail, any pure white under the tail being a great objection. This French grey is minutely pencilled all over with fine black lines. The back is a rich greenish black, the curls in the tail being a dark green. The wings are a greyish brown, with a "ribbon-mark" across them, which must be a very bright and distinct blue, edged on both sides with black and white bands. The flights are grey and brown, white in a flight-feather being highly objectionable. The drake's legs are a rich orange.

The bill of the duck is of an orange colour, with a splash of nearly black upon it, two-thirds down from the head, but not reaching the base, tip, or sides; this colour, however, changes during the laying season to a dirty brown, and sometimes they become almost black all over. The head is brown, with two distinct shaded lines on each side, running from the eye down to the darker part of the neck. The breast is brown, pencilled over with dark brown; the back pencilled with very dark brown, or black glossed with green upon a brown ground. This pencilling must be very distinct, though judges differ somewhat as to the shade of brown which should form the ground-work. The wing has a ribbon-mark, as in the drake, and the legs are like his, orange, but of a dusky shade.

Rouen ducklings when hatched are brown and yellow. When first feathered the drake has the same plumage as the duck, but at three months or soon after begins to moult into the



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ROUEN DUCKS.

CAYUGA DUCKS

male colours. The following summer and every summer afterwards, about June or July, he moults temporarily into very nearly the sombre garb of the female, until late in the autumn he resumes his male plumage again.

In mating Rouen ducks for exhibition, the breeder should look to markings, and shape and size of frame, rather than weight, a drake of 7 lbs. being quite heavy enough to breed fine stock, and if more than a pound or so heavier than that, being seldom so vigorous and fertile. He is better not over eighteen months old, but the duck may be older. Dark drakes mated with dark ducks generally produce the best coloured drakes, and a dark drake with light but well marked females the best coloured ducks; thus one pen can be made up very well, with ducks of different shades. Sometimes a fine drake will come with his wing twisted: such a bird, if of good strain, need not be rejected for breeding.

Rouen ducks are hardy, and delicate in flesh, and fully as large as Aylesburys; but they are not such good or such early layers, and do not mature in size nearly so quickly. Hence they are not so well adapted for a spring trade, neither are the feathers so valuable, nor does the carcase look so nice when plucked as the white-feathered birds. The heavy keel is also somewhat against them. For a later market, some think that they make finer birds. Some portion of Rouen blood enters very widely into the common coloured ducks seen in farmyards all over the country.

Pekin Ducks.

The Pekin duck is a comparatively recent introduction, and one of the most valuable. It is rather doubtful whether the first importations were made into England or America, Mr. Palmer in the United States and Mr. Keele in England having both imported birds in 1873, and both exhibiting them in 1874; but in each case there is no doubt they came from Pekin, and were from the first a most well-marked variety, though they bred freely with other ducks.

The Pekin duck differs from others in the shape and carriage of its body, in a full spherical growth of feathers under the rump, and a singular turned-up carriage of the tail, the whole irresistibly suggesting the outline of an Indian canoe. The legs are set far back, which makes the bird walk rather upright or penguin fashion. The neck is somewhat long, and the head decidedly large in proportion. The legs and bill are a rich yellow or reddish orange, the bill being shorter than in the two preceding varieties; and the plumage approaches white, with a peculiar canary yellow running through it. At one time some exhibitors showed pure white, but such specimens nearly always had pale bills, and there is no doubt that they originated in a cross with the Aylesbury, which was at one time very prevalent in both breeds, and is even now not altogether banished from either. But it is now fully recognised that canary plumage, deep orange bill and legs, and erect canoe-like body make the true type of the Pekin. It differs further from both the preceding in having no keel.

The Pekin duck has strong characteristics in qualities, as well as in colour and shape. It is a non-sitter, and a most prolific layer, especially if bred for that quality systematically as in America, where many ducks have laid over 150 eggs in a year. When at large they are very active, and their plumage and colour of bill give no reason for keeping them out of the sun. They are very large in frame, but the plumage is so thick that they rarely weigh what they look in England, where they were rashly pronounced small, not adapted for fattening in confinement, and dry in flesh. In America, on the contrary, this duck is the one almost universally bred on the great duck ranches; and there it proves, not only the best layer, but the most succulent in flesh. Some of the American breeders describe their birds as "keeled"; but this is not what is understood by "keel" in England, as explained farther on. A pair on Mr. Hallock's ranche at Speonk, Long Island, where 25,000 are raised annually, weighed weekly, proved 3 ozs. *each* at 1 week old, 5½ ozs. at 2 weeks, 7½ ozs. at 3 weeks, 1 lb. 3 ozs. at 4 weeks, 2 lbs. 6 ozs. at 5 weeks, 3 lbs. 12 ozs. at 6 weeks, 4 lbs. 12 ozs. at 7 weeks, 6 lbs. 12 ozs. at 8 weeks, 7 lbs. 4 ozs. at 9 weeks, 8 lbs. at 10 weeks, and 9 lbs. 3 ozs. (each) at 11 weeks. The pair were admittedly somewhat above the average, but by no means exceptional. Such weights as these would not be attained by British Pekin stock at the time we write. But the old prejudices are dying out, and several dealers in the London Central Market have told us that year by year the Pekin is by degrees displacing the Aylesbury, the flesh being much liked, and the absence or comparative absence of keel being a point in its favour.

On the water the Pekin duck is particularly ornamental. The Poultry Club Standard for Pekins will be found at the end of this chapter.

Of the various breeds of ducks, the greatest forager and most prolific layer is beyond doubt the Indian Runner. We are indebted to Mr. J. W. Walton, of Tow Law, Co. Durham, for the following notes on the breed:—

"The best and most authentic account of

Indian Runner Ducks.

the origin and introduction of this remarkable breed is that given in the 'History and Description of the Indian Runner Duck,' by Mr. J. Donald, of Wigton, published about 1890, wherein he states that the first were brought from India about fifty years earlier by a sea captain, who, when ashore, had been attracted by their peculiar carriage and active habits, and after learning of their great egg-producing powers, and that they practically foraged for their living without being artificially fed, brought a few home as a present to some farmer friends in Cumberland. They rapidly established a local reputation for egg production in the district, and seem to have gradually spread northwards over the Scottish border into Dumfriesshire and southwards into Westmorland, but they remained practically unknown anywhere else until about the year 1890.

"At the time Mr. Donald wrote they had lost a good deal of their striking, original character, for he remarks that 'very few of the original type are now to be found, and the carriage is not so penguin-like as formerly; whether owing to climatic influences, to the introduction of foreign blood into many strains, or to in-breeding, it is difficult to say with accuracy, but probably they have all shared to a greater, or lesser degree in producing these defects.

"He also noted the fact that a good many of the Indian Runners of that period had been produced by the use of Runner drakes with farmyard ducks, for we are told, as the fame of the breed as layers extended, the drakes were eagerly sought after and largely employed to cross with the common ducks of the county with a view to improving their egg-producing qualities, the Runner drakes stamping their distinctive characters most pronouncedly upon the produce of the cross, and in a good many so-called Runners seen even then the distinctive characters of the breed were in a great measure obliterated; and it is undoubtedly to the timely publication of Mr. Donald's brochure that the Fancy owes the preservation of many of the best and most distinctive characters of the original stock.

"Early in the 'nineties fanciers began to take up the breed, and in 1896 a large class of twenty-one pairs was got together at Kendal Show, chiefly by the efforts of Miss Wilson-Wilson, of that town. This was the beginning of their popularity, the display at Kendal being rapidly followed by classes at the Dairy, Crystal Palace, and other great shows. The Waterfowl Club took up the breed, and drafted a Standard, but, unfortunately, the professional exhibitors, whose chief aim in the other varieties had been the production of size and fine coloured feathers, failed hopelessly when they tackled the Indian Runner and set the fashion for it as an exhibition bird. At the very outset the fatal mistake was made of showing a very decided preference for evenly marked plumage at the expense of true form and carriage. The idea then was to have nothing but clean-cut birds, with body markings somewhat similar to those of a Magpie pigeon, and had the club insisted upon type *first*, markings *second*, all might have been well; but the craze for markings at any price soon brought disaster upon the breed. The pioneer breeders, disgusted at the ignorance of writers and the decisions of judges of that period, soon gave up showing, and kept their birds at home, breeding them to meet their own views. The desired markings were easily enough produced upon cross-bred Runners and common ducks, and things drifted from bad to worse until the showing of Runners became a mockery, and the exhibits were reduced to evenly marked but shapeless mongrels, totally at variance with the genuine breed and comparatively worthless as foragers or layers.

"Some dealers who followed the lead of the show-bench bred large numbers of these birds, and spread them over the country as pure Indian Runners, and it is impossible to estimate the harm done by this means. Many who took them up became dissatisfied with their commonplace appearance, and after vainly endeavouring to improve their shape and carriage, became thoroughly disheartened and gave them up in despair and disgust—but the tares had been sown, and are still strongly in evidence up to the present time.

"Mr. Donald tells of the decadence in his own yard, resulting from an attempt to introduce new blood by the use of a drake from a Yorkshire poultry farm, many years being required to breed out the bad qualities thereby introduced.

"The Indian Runner Duck Club, a few years ago, took up the work of reviving the true type, and under its influence a marked change for the better is now noticeable in the general quality of stock shown; further improvement is within sight, and it now appears almost certain that the Runner will regain all its distinctive character, and be likely to spring into greater popularity in the near future.

"There seems now no room for doubt but

that the first Indian parents of the breed introduced into this country were of a most outstanding type, calculated to arrest the attention of the most casual observer and capable of transmitting their peculiar characters with great power to their offspring. No detailed description of their colour and markings has been handed down, but, in the light of what is now known, it is likely that they were mostly whole- or self-coloured birds, and when crossed upon the common ducks of Cumberland they produced the race of broken-coloured Runners from which, it seems to us highly probable, the evenly marked fawn and whites have been cultivated by careful selection in breeding, for Mr. Donald, in his pamphlet, mentions that from want of selection even markings were then difficult to attain and apt to come more broken in colour than given in his illustration.

"The Indian Runner is a natural utility duck, specially adapted for foraging and egg-laying, and the type cannot be impaired without a corresponding decline in utility qualities. It is the elevated bottle-like body, balanced in such a manner as to give perfect freedom of movement, and the legs pitched far back, allowing the quick-running gait, which give the Runner duck such an immense advantage over all others and places it supreme as a forager and layer. The great speed and foraging instinct of the Runner enables it to travel over wide areas in search of insects and various forms of animal and vegetable life, which form a great part of its sustenance and reduces hand-feeding to a minimum.

"When viewed at liberty, a flock of first-rate specimens, with their smart appearance and erect bearing, present a fine sight; the pace at which they run is surprising, and when alarmed or startled it is interesting and amusing to note how quickly they line up, and then, forming into a solid block, they will mark time, wheel, or advance like a company of well-trained soldiers.

"In disposition they are restless and alert, always being on the move, but seldom or never making any attempt to fly. The wings are carried higher up and much more closely packed than in ordinary ducks, and, from long disuse, they seem almost incapable of the power of flight.

"Runners should be symmetrically formed and properly balanced, and in the best specimens the legs are pitched so far back that the bird is compelled to elevate the body to such as extent as to bring neck and body into an almost direct line, the profile being somewhat suggestive of the outline of an old-fashioned soda-water bottle set at an angle of 60 to 70 degrees. The head is carried high, and must be clean and keen-looking, with a strong, well-set bill, eyes placed very high in the skull, and the neck should be very fine and of good length. Many judges at present seem to have a tendency to attach undue importance to mere strength and length of head and bill. The head and bill must be in keeping with and proportionate to the neck and body. The legs are short and strong, with small but very supple feet, and the colour should be in keeping with that of the bill. The bill varies in colour according to age, season and condition, and though yellow or pale green when young, it darkens with age, the bill of an old duck usually turning to a deep cucumber-green.

"Ducks usually range from 3½ lbs. to 4½ lbs. in weight and from 24 ins. to 28 ins. in length, and drakes 4 lbs. to 5 lbs. and from 27 ins. to 30 ins. or more, but they are deceptive in appearance, and usually appear smaller than they really are on account of their compact build and the remarkable tightness and closeness of the plumage.

"The eggs are large for the size of the birds, and mostly white in colour of shell. They are practically land ducks, and require little water—sufficient to drink, and a bath now and again keeping them in excellent condition. The ducklings are easy to rear, and require no special food or treatment beyond what is usual in duck-rearing.

"Mr. Ludlow's fine coloured plate will give readers a good general idea of the characters, form, colour and markings considered most orthodox up to the present time, save that the head and rump markings of the drake should be darker in colour (a dark bronze, with greenish lustre), except in July and August, when the male assumes the female plumage. However, it would seem that a good Runner duck, like a good horse, is never a bad colour, for the Indian Runner Duck Club standard lays it down that, 'above all, type must receive the chief attention of judges, and on no account must evenness of markings and colour be considered in preference to correct shape.'

"The judging of Indian Runners, as we before remarked, has in many cases not been altogether satisfactory in the past, and we would therefore counsel those who are to take on the duty in future to carefully study the lines upon which the true type is built up. For this purpose no better guide than the Indian

Runner Duck Club's descriptive standard can be recommended, and if their awards are made on the lines there laid down the decisions will not be very wide of the mark. The standard points are as follows:—

Head, bill, eyes and neck...	30	points.
Body, shape and carriage ...	45	,,
Colour, markings and condition	25	,,

"In Germany a breed of small white ducks has lately been cultivated and boomed as White Indian Runners. A few of these birds have been seen in the show-pen in this country, but they are of a very ordinary type, and apparently of very common blood, and quite unsuited to English ideas.

"At the Palace Show of 1910 there were shown an old white and some young whole-coloured fawn and brownish fawn ducks far excelling in Runner type anything that has previously been seen in this country, and which caused quite a sensation and produced much curiosity and comment among duck fanciers who had the good fortune to see them.

"At the time of writing these whole-coloured birds are very rare, being, we believe, exclusively in two fanciers' hands, but in our opinion there can be no doubt that they are destined to produce a very marked influence for good on the stocks of this country, and we hope shortly to see them much more in evidence. We believe they are descended from recent importations, but upon their history their owners are at present very reticent.

"The Australians have made the grave mistake of insisting upon and trying to breed drakes with heads the same colour as the body, the result being that the breed has declined greatly under such a ridiculous craze for something out of keeping with the nature of the Runner. The same applies to the American fad regarding the plumage of the duck. They fancied a drab or very pale fawn feathering in the coloured portions of the plumage of the *female*, and the feathers to be quite *plain* without either lacing or pencilling. *All* brown and fawn ducks of the genuine breed (whether whole-coloured or broken with white) have the feathers marked in two shades of colour, either single or double laced; hence they have managed to ruin entirely the character of their stocks in order to obtain a mongrel with every feature and point at variance with the true breed. This shows how easily a wrong idea or impression may cause trouble which cannot be bred out for years."

The Poultry Club standard for the breed will be found at the end of this chapter, and it may interest breeders and genuine fanciers of an inquiring turn of mind to study and compare it with the other published standards, both past and present, English and foreign.

Cayuga Ducks.

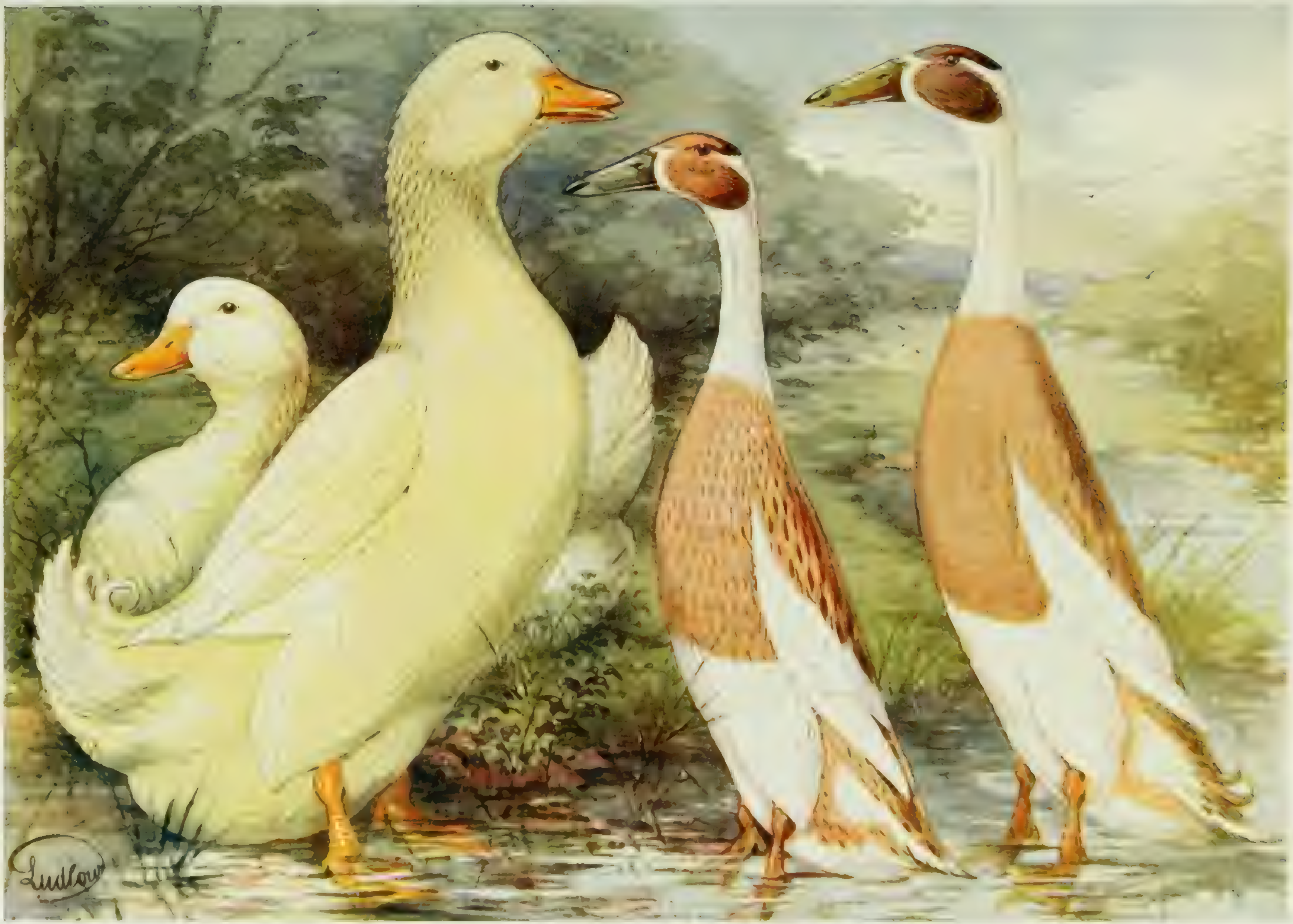
The black Cayuga duck is called after the lake of that name, and comes to us from America, though a large black duck which bred pretty true was known half a century ago in Lancashire. The first American specimens were sent to us by Mr. W. Simpson in 1871, and the late Mr. J. K. Fowler imported them a few years later. These early specimens were not very large, and were rather dingy in colour, and there is no doubt that they were crossed with Black East India ducks in order to get the green gloss of the latter. This was accomplished, but kept them still small; and they were afterwards crossed, by some with Aylesbury and by others with Rouen, to get size. Unfortunately with this the type was also changed, as the original birds had no "keels," while the modern English exhibition Cayuga has this feature very pronounced. It has thus been made an exhibition duck at the expense of popularity in the market.

Owing partly to this change, perhaps, the Cayuga has never quite had its deserts; for general consent attributes to it decided superiority in flavour over any other of the *large* breeds. It is now a large breed, very similar in shape to the Aylesbury, the plumage being a rich black, heavily glossed with green, the legs a sooty orange, the bill a leaden or bluish black, with an intense black splash in the middle and a black bean at the tip. The skin is very white. The breed is hardy, matures early, is a very good layer, and of more quiet and stay-at-home habits than most. If ever Cayugas should come into fashion, these qualities would be in its favour as a market duck, but the black feathers would, of course, be against it, and may be a reason why it is so little bred. After the first year Cayugas are apt to moult more or less white feathers, especially at the base of the bill; but this is no sign of impurity of race.

The following notes on the Crested Duck are from the pen of Mr. Scott Miller, Hon. Secretary of the Crested Duck Club:—

The Crested Duck.

"In general appearance this breed is much like the Aylesbury, though not quite so large (adults usually weighing about 8 lbs.) and without the heavy keel of the latter; also the head is adorned with a crest or top-knot, which should



PEKIN DUCKS

INDIAN RUNNER DUCKS

be globular in shape, as large as possible, and set evenly on the head: a common fault, especially in ducks with large crests, being that the crest hangs more to one side than the other. The breed is to be found in certain districts all over the British Isles, and is also known in America and other places abroad. It is known to have existed in Scotland at least seventy years ago. As to origin, we can only theorise, the theories we have heard advanced being that the breed was introduced pure from the East, or may have been produced by ducks frequenting quiet lakes mating with crested wildfowl, such as Grebes, if such mating be possible, or may have been bred from sports from common ducks; the latter is, in our opinion, the most feasible.

"Whilst being decidedly ornamental, this variety is also a first-class utility one, the ducks being excellent layers of large eggs and themselves making a very creditable appearance on the table. Crested ducks always throw a number of crestless ducklings, but these can be picked out as soon as dry; and, similarly, the size of crest, in crested specimens, can be readily told, as the crests are of the same size, *in proportion*, as they will be when the bird is full grown. This only holds good for the first three or four days after hatching, as the bird soon commences to outgrow its crest, which grows little till the bird gets its first feathers. Fanciers find that fewer crestless birds hatch year by year.

"It is a strange fact that those youngsters with very large crests generally appear very delicate for the first three days or so, and many die during this period; they rush about apparently afraid of their large head-dress. When this occurs, the breeder should try the remedy of clipping the fluff of the crest short, care being taken not to injure the scalp. In breeding, it is advisable to use crested birds on both sides, though good ones can be bred from plain-headed birds, provided they are crest-bred—that is, from crested parents; but in our opinion this encourages the plain-headed element, which is most objectionable. Choose nice, large, typical birds—one often reads in poultry books that the female has most influence on the size of the progeny, but our experience in this breed is that the drake influences the size quite as much as the duck—with nice, evenly-shaped, and well-placed crests; those having long feathers in the crest are preferable to those with short, the reason being that the crest in ducks, like that in Polish fowls, is composed of a spherical protuberance of the skull-bone, this being the main cause of the crest, length of feather greatly adding thereto. Crested ducks may be of any colour, and need no special care in rearing (beyond what is mentioned above) or general management, being hardy and reaching maturity at an early age. Care should, however, be taken that the crest feathers do not damage the eyes, either by clipping the offending feathers or binding with an elastic band."

The Poultry Club standard for the breed will be found at the end of this chapter.

Blue Ducks.

Blue races of ducks are obviously allied to black, and have often appeared. The late Mr. Teebay several times told us that about 1860 there was a recognised local race of large blue ducks in Lancashire, and more or less of that colour would be produced by crossing white with either black, or even any dark breed like the Rouen. The same colour has been imported and bred in the United States under the name of blue Swedish ducks, which it is said really were introduced from northern Europe, and only differ from the foregoing in having a white throat or semi-collar at the front of the base of the neck. More recently blue ducks have been bred and sold as "Orpingtons."

Buff and Blue Orpington Ducks.

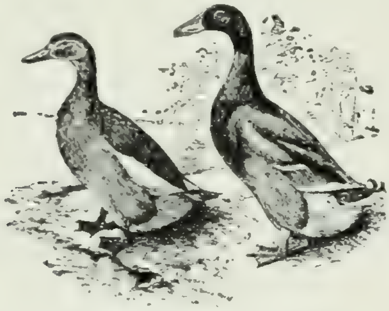
Writing to *The Feathered World* in 1910, Mr. A. C. Gilbert, Hon. Secretary of the Orpington Duck Club, thus describes the origin of the Buff and the Blue Orpington duck:—

"Buff Orpington ducks were made some twelve or fourteen years back, but not brought into prominence in England until 1908, when they were shown at several large shows, such as the Dairy and Crystal Palace, where classes were guaranteed for them by Mr. A. C. Gilbert, who also at the same time drew up standards for them and formed a club for them. In Australia they had previously made their reputation by winning two twelve months' laying competitions in succession.

"They were made to fill the demand for a first-class layer, and at the same time a nice-sized table bird of fine quality and flavoured flesh. The start was made by mating Indian Runners to Aylesburys, Indian Runners to Rouens, and Indian Runners to Cayugas.

"These different varieties previously to this mating up had been carefully mated and bred for three years for egg-production alone, all laggards in this respect being noted and weeded out, so that when the pure stock was put together for the first crossing a line of good layers was included in all four breeds. The descendants of these matings were then crossed back and forth on to one another until, with time, care, and patience, the desired end was accomplished. But before this came about it was noticed that a great many of the offspring came with a lot of blue on the back, wings, thighs, and portions of the neck. This put the idea into the head of the originator (the late Mr. William Cook) to make a Blue Orpington duck, as well as Buff Orpington ducks; so the darkest and the ones with most blue markings were put on one side and mated with Cayugas and Pekins. Then the same process went on with these, mating and intermating, until the Blue Orpington ducks were a finished article, the same as the Buffs.

"Both varieties are most useful and at the same time very handsome and good to look at. They are very hardy, easy to rear, quick in growth, and good foragers on an open space or field, finding most of their own food; very active and fertile, being equally good with a pond or stream, or merely a trough or drinker, for their water. In mild countries, such as the British Isles, they require no houses, doing well out in the open run, field or stackyard."



Buff Orpington Ducks.

The Standard for the breed appears at the end of this chapter.

Campbell Ducks.

A successful attempt to create by crossing and selection a new breed of ducks which should exhibit real superiority in useful qualities has resulted in what are known as Campbell ducks, produced by Mrs. Campbell, of Uley, in Gloucestershire. These are now bred in two colours. The original strain was descended from one duck which exhibited most remarkable laying powers, and was probably something of the Rouen colour, since the original Campbells are somewhat like Rouens in appearance, but much lighter, with a plain head of a greyish brown shade, and no streak running from the eye: the drakes have grey backs and a pale claret breast—the legs yellow. The object was to produce excellence in laying, with fair table qualities and quick maturity; and it is stated that for years past the egg-average has been over 200 per annum, while the young are hatched at all seasons, and do well all the year round. They are not very large, stock birds weighing 4½ lbs. to 5 lbs., and in flavour considerably resemble the wild Mallard, which was used in crossing as one of the foundations of the strain.

The other sub-variety is more recent, and is known as the Khaki or Khaki-Campbell duck. The drake is khaki colour all over except the head and stern, which are bronze green; the duck is entirely khaki colour, a delicate lacing of darker buff showing on each feather. The Indian Runner has been used in crossing to produce this variety, and as the result the Khaki duck is of extremely active habits, doing best on a good range, and showing very little desire for swimming—in fact, Mrs. Campbell, we believe, only allows them drinking water. At twelve weeks old the ducklings come up to about 4 lbs. to 4½ lbs., the laying being about the same average as the other strain. Whatever time of year they are hatched, they are said to commence laying at or before six months old, so that by hatching about three lots, very early, medium, and late, eggs are easily obtained every day in the year.

Continental Ducks.

Much was said at one time about the Duclair duck, named from a town between Havre and Rouen, and the chief duck of that district; but there appears nothing distinctive about it at all. The colour is much like that of carelessly bred and mis-marked Rouens, or rather of common farmyard ducks with Rouen blood; and those imported gave no better results than the old English breeds. The beautiful smooth white skin so admired is the result of French feeding, devoted to birds without keel. These ducks are long in shape, and not so deep in body as Rouens, and are very good layers. The same in effect may be said of the Belgian races called Laplaigne, Merchtem, etc., occasionally seen at London shows of table poultry: their distinctness of race is mostly very dubious, and the same feeding would certainly, in a generation or two, produce better results with the races familiar to our readers.

The most distinctive race of all is the Peruvian or Muscovy or Musk duck, which alone appears not to be descended from the

Muscovy Ducks.

Mallard. It comes not from the north at all, but from South America; is very different in many characteristics; and the progeny when crossed with other varieties appear to be real hybrids, being decidedly sterile *inter se*, though fertile more or less with either parent strain. The name is derived from an odour of musk which pervades the skin, but which disappears when cooked. The generic name is *Cairina moschata*.

The wild Muscovy duck is very agile, often perching upon trees, and even making its nest occasionally in such situations. Another peculiarity is the disparity in size between the sexes, a fine drake weighing perhaps 11 lbs. or 12 lbs., while the female will be only 6 lbs. or 7 lbs.; and the male has no curled feathers in his tail like other breeds. The feathers on the body are very large and broad, and often appear loose as if ready to drop out. The head of the drake is very large, and in both sexes the cheeks are naked, with scarlet fleshy carunculations, very developed in the male, and giving him a peculiar leery and wicked expression. This is not belied by his temper, which is very bad with other ducks and poultry, and the drakes also fight fiercely among themselves, another point in which they differ from other breeds. The period of incubation also differs, being from thirty-four to thirty-five days.

The general colour of the Muscovy duck is pied black and white; whole white, whole black, and blue dun being also found. The legs are pale yellow, and the toes have very sharp claws. The eggs are large and white, but the duck is a poor layer. The flesh is rich, and at one time the bird was popular in America, and considerably used for crossing; but this has been nearly abandoned, and the breed cannot be considered a profitable one.

Duck-Farming in England.

Duck-raising for market, or duck-farming, is an ancient industry in England, being for some generations almost confined to the Vale of Aylesbury, which is still a great centre of supply for the best trade of the London market. That the business should so long have been a local one, is rather surprising, as the voracious appetite, hardihood, and rapid growth of ducklings afford quicker returns from them than in any other branch of poultry-rearing, whilst numbers are handled with so much greater facility in a small space: the local breed had, however, doubtless much to do with this. So long ago as 1870 the receipts of the Vale amounted to over £20,000 a year, and in 1900 this had increased by about fifty per cent., but since that date the trade of this locality has practically not increased. As a rule the birds are sent up to London twice or three times a week, several tons sometimes going up in a single night; and a system has grown up, as in Sussex, by which the railway companies collect the birds in "flats," and return the empty packages to the roadside, for an inclusive charge of one penny per bird.

While there always have been a few larger raisers, the bulk of the trade in Bucks at this time was in the hands of moderate or small men, who raised probably about a thousand birds each. These "duckers" would begin to collect eggs for sitting from the farmers after Michaelmas, generally contracting to take all any man could supply them with from that time till next June, at one average price, which in 1870 was 2s. or 2s. 6d. per dozen; if eggs were bought in December and January only, the cost per sitting would be double that price. Hens were hired at about 3s. 6d. each, and were set as fast as they and the eggs for them could be procured. When hatched, four or five broods were put together, so that every hen left in charge had twenty-five to fifty; and the young birds were, as the hatching progressed, distributed in some cottages over *every room in the house*, including bedrooms, a single room accommodating in some cases two or three hens with their families, separated by boards placed on edge. The noise at feeding times was deafening. The first food was usually chopped egg and bread-crumbs, then chopped egg and boiled rice mixed with meal, later on mainly meal and rice mixed with boiled greaves, or other cheap meat, with green food as required.

In 1890, while this trade had considerably extended as stated above, the profits had somewhat decreased. The cost of eggs had gone up to about 4s. per dozen through the season, or as much as 12s. a dozen for December only, and the average market price had fallen about 2s. per couple, though a guinea could still be realised for the choicest ducklings in February and March. Against this, the cost of food had somewhat fallen. Sanitary legislation had also placed salutary check upon the extraordinary indoor arrangements above described, once so prevalent in many cottages, and more birds were reared in consequence out of doors than formerly, in pens with some slight shelter, though many ground floors were still occupied in the old way. A few larger raisers were gradually beginning to use incubators, and some of them to keep ducks and breed their own eggs for hatching; but the main business of the "duckers" was still done by purchasing eggs, and hiring hens, in the old way. The cost of rearing a duckling to 4 lbs. weight at eight or nine weeks old, was usually reckoned at 1s. 6d. to 2s. per bird. They should be ready by that age; and must at all events be marketed before they are eleven weeks old, as about that age they begin to moult into their adult feathers, after which they grow no heavier for many weeks, whilst the pin-feather lowers both quality and price terribly.

Since 1890 further changes have taken place in British duck-farming. The industry has grown and developed very largely, either finding or creating a much larger market than in former years; but the Aylesbury Vale portion of it has not done more than hold its own, if it has even done so much, the extension taking place in other districts. For this some reasons have already been given; but it should also be observed that a large part of the new demand has been due to the middle classes, and the more prosperous portion of the working classes, who have required ducks at more ordinary seasons and at lower prices, thus prolonging the season for hatching, and continuing sales into September, though at lower prices than during the spring trade. Some have connected with this change in length of season, the more extensive cultivation of Pekin ducks, or crosses with them, which have formed a large portion of the new supplies; but the results of inquiries which we have made go to show that these ducks have also gradually found favour in the London spring market, and that crosses are beginning to form part of even some of the Aylesbury trade. In Buckinghamshire itself a system of large rearing-sheds has been introduced to some extent, thus replacing in a way the birds no longer allowed in cottage rooms; but otherwise the old cottage methods are still followed pretty largely. The following description of duck-farming as now carried on in England was contributed to our last edition by Mr. Edward Brown, F.L.S., who made special personal investigation in order to prepare it for these pages.

"Since the first publication of the *Illustrated Book of Poultry* many and great changes have taken place in the English duck-raising industry. About the year 1875 the bounds were broken, first over the border into Bedfordshire, where large numbers are reared around Eaton Bray, and subsequently the area has been still further extended. Probably more ducklings are now produced around Chesham and Princes Risborough, in Bucks, and in the eastern districts of Oxfordshire, than in the Aylesbury district itself; and other parts of England have shown that they can equal Buckinghamshire as to quality, and excel it as to quantity of ducklings produced. Aylesbury men still claim that their birds are the finest in the world, but their preeminence has been lost, and birds from other districts now compete with them successfully. That many of these duckers are yet very skilful is unquestionable; but their very success has led to neglect. They have been content to continue in the old ruts, have neglected the prevention of tainted soil, and being firmly convinced that their locally bred ducks were the best, have bought stock from each other, so that in-breeding has resulted, with consequent degeneracy. Soft-bill, which appears to be a result of close breeding, and other weaknesses, are now seriously prevalent in Bucks, whilst they are practically unknown elsewhere. Recently there has been an awakening among the younger duckers in that county; but much of the trade has gone, never to be regained. From the national point of view this is not regrettable, as it has led to a great increase in duck-raising in other parts of the country.

"In the districts of Bucks and Beds to which reference has already been made, the method adopted is very much on the old lines, with the exception that in a few cases artificial methods are now being introduced, and in others operations are carried out upon a larger scale than formerly. I have visited a farmer near Eaton Bray in Bedfordshire, who markets about 10,000 ducklings a year. In this case, as in most others, he buys the eggs, hatches them under hens, and rears and finishes off for the market. For the work of rearing he has a long range of shedding, with doors in front similar to those fitted to stables, divided into two parts so that the birds can be enclosed within the building and yet obtain plenty of air and light. This shed is about ten feet wide, and divided into compartments six feet or more in width as the birds grow larger, each holding about fifty birds; the divisions being simply boards about 18 inches in height, which can be easily stepped over. In front are enclosed yards where the birds are fed. In his case, as in many others, there is great variety in the food given to the birds. It is generally conceded that the best food during the latter part of the feeding is rice, but in many cases barley meal and Indian meal are employed by reason of their cheapness, though it is universally admitted that the results are not so satisfactory as with rice-feeding. Most of the duckers employ tallow greaves for mixing with the meal or rice, as the case may be, and large quantities of greaves are used in this way.

"The majority of the duck fatteners are small occupiers, and a report presented to the last Royal Commission on Agriculture in 1895, written by Mr. Aubrey Spencer, Assistant Commissioner, summarises the methods still adopted in Bucks and Beds.

> The persons who engage in duck fattening are generally men of the labouring or small village tradesman class. The number of ducklings reared and sold annually by individuals varies from a few hundred to several thousands. The ducks require constant care and attention all through the spring months, and no one who rears a large number has, during that period, time to engage in any other work; but where a comparatively small number are reared the female portion of the household may do most of the necessary work. Many of those engaged in rearing, however, find time to carry on some other occupation in the autumn months, such as shoe-making, or at any rate can earn a little extra money by harvesting and occasional agricultural work. At Weston Turville I was told that about eleven men in that village fattened 1,000 ducks apiece annually, and that about 16,000 or 17,000 were sent from there to London in a year. As a rule the duck fatteners do not themselves keep stock ducks, but buy eggs from farmers or others who keep breeding ducks, so that the breeding and rearing are in different hands.
>
> It is a main object of the duck fattener to bring out as many young ducks as he can ready for the market in February or early in March, when the game season is over, and the highest prices are obtainable for ducklings. The season for ducklings commences in February and continues till about the end of August, the prices falling as the year advances. In February or March as much as £1 1s. a couple is occasionally obtained for ducklings, and one fattener at Weston Turville informed me that in 1894 he had obtained the very exceptional price of 24s. for a couple, which was the highest figure he had ever reached. The average in March is more usually about 12s. or 14s. the couple. The carriage and salesman's commission (5 per cent.) for the ducklings are reckoned at about 3d. a bird, and duck fatteners commonly estimated that after deducting carriage and commission they would receive on the average throughout the season about 3s. to 3s. 3d. a duck. I am, however, inclined to think that this estimate is rather under than over the mark, for in August, when I visited the district, prices were still as high as 6s. to 7s. a couple.

"Large quantities are now produced around Diss in Norfolk, where the system is very similar to that followed in Buckinghamshire, in Lincolnshire, and North Lancashire; and recently many ducklings have been produced in Cornwall, where for climatic reasons there may probably be a great development in process of time. At many of these places the system adopted does not call for any special mention; but two cases afford an excellent example of what can be done by other methods, and may perhaps be regarded as the most advanced duck farms in the country.

"The first of these duck-farms is at Bourne Hall, near Poulton-le-Fylde, in North Lancashire, and is owned by Mr. Peter Walsh, who possesses the most extensive duck-farm at the present time in this country. Mr. Walsh has occupied his farm, which comprises about 285 acres, for twelve years. It consists of a clay loam, and is situated a mile from the sea, about five miles from Fleetwood, and six miles from Blackpool. The farm is largely pasture, and the other members of the Walsh family devote themselves to dairying, selling the milk, about sixty-five cows being kept. Eleven years ago Mr. Walsh, who had read a great deal about duck-fattening in the South Midlands of England, determined to try whether it was possible to establish an industry in his district. For two years he worked against manifest disadvantages from inexperience, and at the end of that time was so discouraged that he gave it up. But a year afterwards he commenced again. The first season he hatched, reared, and fatted slightly under 2,000 ducklings, steadily advancing since year by year, until during the season of 1901 he hatched and reared 25,000 ducklings, in addition to which he purchased nearly 5,000 more to feed off. Such an industry is worthy of careful observation, because there can be no question that Mr. Walsh has made it profitable, and some of his methods have been considerably modified since he first began his enterprise.

"Mr. Walsh now keeps no breeding ducks whatever, but as a result of the demand created by him (especially as his example has been followed by others in the district), a very much greater number of ducks are kept throughout that part of Lancashire, the farmers finding it profitable to keep the ducks, and to sell the eggs to Mr. Walsh's (and other) collectors. These collectors go round regularly to the farms, and attend the markets almost as far as Lancaster and Preston. Whilst the majority of the birds are largely of Aylesbury blood, there has been a good deal of Pekin influence introduced into the district, and Mr. Walsh believes that the cross between the Aylesbury and the Pekin gives the best results for his class of trade. He does not attempt to produce first-class ducklings, such as still come from Bucks and Beds, especially as his demand is chiefly in Lancashire and Yorkshire, where the prices obtainable in London during the spring months of the year are not paid. But it is impossible for him to obtain sufficient eggs from the immediate district, and therefore he buys more wherever he can secure them, obtaining a goodly number from Ireland, as well as from the south of England. These longer-distance eggs are not nearly so good for hatching as those produced in the immediate district, and give him many more coloured specimens than he likes. The prices paid for the eggs are 2s. and 1s. 6d. per dozen, in accordance with the time of year, and farmers find the production of eggs at these prices profitable.

"So far as hatching is concerned, during some of my former visits to Bourne Hall I found that Mr. Walsh then used a considerable number of hens; but these have now been altogether discarded. He is the inventor of what is known as the Acme incubator, a machine which is regulated by means of a capsule, and very similar in many respects to the Hearson. During the season of 1901 he had sixty-five of these incubators at work, each of which holds about 100 duck eggs. They were accommodated in five rooms, not specially built, but simply some of the existing farm places adapted to the purpose. They would have been better for the purpose had there been more ventilation. He does not keep a great number of machines in a room, and believes that this gives better results than having one large incubator house. His experience is that incubators are more reliable, and more easily managed than hens, provided of course that proper attention is given to the machines, and this work he does almost entirely himself. No moisture is placed in the trays; but every time of cooling the eggs are damped. Mr. Walsh does not attempt to keep records, but says that the near-by eggs (that is, those produced in the Fylde district) give much better results than those coming from a distance.

"When the ducklings are hatched, and thoroughly dry, they are removed to a large foster-mother, which is fitted with circular pipes, and under these pipes they are placed in trays, where they are kept for two days. This foster-mother accommodates 1,000 young ducklings at one time. They are then placed in other foster-mothers, which are kept out in the open, and at a low temperature. This is to harden the birds off, and the heat given depends largely upon the period of the year, in warm weather being comparatively low.

"At the end of nine days the ducklings are divided into flocks of 100, and placed in small houses. These houses are of the very cheapest make, in fact consist of large packing cases, which are bought at about 6d. each, and require very little alteration; a door being simply cut from the lid, which is then nailed on to the box, the door alone being hinged, and the cost of each house being under a shilling. Each case is on an average about 30 inches square, and when the ducklings are first put out, two of them are placed in each run of about twenty feet square, and after feeding they are put back, fifty in each case. As they increase in size, another box is added, or even two to avoid overcrowding. The runs are formed of inch-mesh wire netting one foot wide, and (as mentioned shortly) are put down temporarily. The birds are fed at first every two hours, as also while in the foster-mothers, and gradually the period is extended until the feeding is five times a day. They are allowed out in the runs for feeding, but as soon as satisfied they are driven back into the houses, and kept there until the next time of feeding. Thus they are not exposed at this stage to the air except during the feeding.

"The food given is as follows: When first hatched clear eggs are used, hard boiled, chopped fine, and mixed with the best bread, special loaves being baked, weighing 8 to 10 lbs. each, with plenty of crumb. The bread is used new, and this method of feeding is continued for about a week, but during the last two or three days a little bran is added to the bread and hard boiled egg, the whole being slightly moistened with milk. At the end of about a week the feeding is changed, and now consists of barley meal, bran, middlings, oatmeal, and a little maize meal, in accordance with the prices at which the meals can be purchased. Oatmeal is greatly preferred, but it can only be used to a limited extent by reason of its cost. In the second week meat is added in the shape of tallow scrap-cake, or liverine. The food is prepared by steaming, but is not always given hot. This system of feeding continues until the birds are five to six weeks old, in accordance with their development. Mr. Walsh has found by experience that when they are about from three to five weeks old they must have animal food, as this is the stage when the feathers are growing, and if denied this they are found to pull the feathers from each other. The system pursued during this period yields an astonishing frame in about six weeks, when the final process of fattening commences.

"The birds are now placed in larger runs about twenty-five yards square, divided by wire netting in the same manner as already indicated, and from this time until the period of killing are not kept under cover at all, but allowed to sleep in the open air entirely. During this last stage they are fed chiefly upon Indian meal and fat, with which is mixed a little of the best broad bran, the object of which is to keep the bowels in proper order. Mr. Walsh would prefer to use rice, to secure the best quality, but finds this too expensive for his particular class of trade. The system here described yields birds averaging about 60 lbs. per dozen when killed, which for the Aylesbury and Pekin cross, should be when they are between nine and ten weeks old. It will be seen that the system employed is not so speedy as that followed in Bucks and Beds, and it is evident that the quality, as already referred to, would not command the best prices in southern markets. During the whole period of rearing and fattening the birds are not allowed to swim in water, but are given a small quantity to drink.

"The killing is by dislocation of the neck. As soon as the bird is killed, it is hung up by one of the feet for five or ten minutes. The killer has a barrel with the open end upwards, and in the side of the barrel there are slits, into which he puts one of the feet of the bird, allowing the head to hang down. The object of this is that the blood may gather in the neck. Thus the plucking does not commence until nearly ten minutes after the killing, and it is stated that if done immediately the bird is dead, in certain parts of the body the blood goes to the holes from which the feathers have been drawn, instead of to the neck. This statement I had not heard before, and it may be peculiar to ducks, as in connection with table poultry it is customary to pluck directly the birds are dead. The labour of attending to the ducklings, killing, and plucking, occupied the attention of ten men, chiefly Irishmen, who engage themselves for the season from March to September. They do everything, as no women are employed about the place.

"One most important point to keep in view is the system pursued to avoid tainting the ground. Of course, upon so large a farm there is practically no limitation of space, but for convenience the fields near the house are generally used. No field, after being employed one season for the ducklings, is used again in the same manner for at least three years; and as upon the field which has been used during 1901, sometimes as many as 7,000 ducklings were to be found at one time, it will be seen that the ground was very thickly covered, and the amount of manure produced must have been very large indeed. Of course, the grass was eaten closely, but the following year the growth is luxuriant, and of fine quality, so that the manurial value is very considerable. Mr. Walsh thinks that the effect of this manure is exhausted quickly, and that it would not remain much beyond the second year. Upon that point, however, his observations have not been made at all closely.

"This enterprise has now been carried on without a break for eight years, and disposes of a statement made in *The Field* not very long ago, to the effect that no duck-farm had been conducted for more than two years. The whole enterprise is very simply carried out, yet with great skill, and is a proof of what can be done even in the most unlikely district by energy and perseverance. Nearly all the birds are sent to the great towns of Lancashire and Yorkshire, and during the busy season as many as 1,500 are frequently despatched in one week. Mr. Walsh is certainly favoured with railway rates, as these are very reasonable indeed. It may be mentioned that about Christmas time he also feeds off something like 5,000 geese. The feathers are carefully placed loosely in sacks, which are hung up and sent away at the end of the season. The wing and tail quills are thrown away, as they cannot be sold, but the duck and goose feathers realise very high prices. During the season of 1901 a ton and a half of these feathers were sold, and the money received, amounting to nearly £250, goes a long way towards paying the labour bill.

"Three miles from Woodbridge in Suffolk is a duck-farm which is conducted upon different principles. This is at Dallinghoo, and is owned by the Rev. Stewart Walford, whose manager, Mr. R. W. Murrell, has courteously given me all particulars with regard to the business which he is building up there. Mr. Murrell was born and brought up in Norfolk, but has lived many years in Canada and the United States, where he had considerable experience in this industry. The farm is 35 acres in extent, mostly a meadow with a little arable land, the soil being heavy in its nature and distinctly poor in quality, the original grass being coarse, and covered with a rough growth which is of little value for feeding purposes.

"Here no attempt is made to keep breeding stock, nor is any hatching done. The ducklings are hatched by farmers, mostly in Norfolk, and are bought very young, as follows: In January, February, and March, one day old; in April, first week, one week old; second week, two weeks old; third week, three weeks old; fourth week, four weeks old; in May, first week and onwards, five weeks old. The price paid for all is one shilling each. The ducklings are never purchased more than five weeks old, and none are bought after August. When the birds are received they are placed out in open pens, which are formed by 50-yard rolls of netting, 2 inches mesh and 18 inches high; thus each pen is fifty yards in circumference. The ducklings always sleep in the open at all seasons after the age of four weeks; previous to that age being accommodated in small sheds. During very rough weather some canvas is hung on to the netting to afford a little shelter.

"The feeding is as follows: A mixture is made of barley meal, 4 parts; middlings, 3 parts; bran, 2 parts; maize meal, 1 part; and tallow greaves, one-eighth part in bulk. The food is thoroughly mixed and prepared crumbly moist, and it is kept always before the birds. It is either put down upon the ground or upon sacks, never fed from troughs. Mr. Murrell says that the mixture given above is properly proportioned, and that is of great importance. Water is supplied, but not as much as the birds would drink. As with those of Mr. Walsh, they are not allowed to swim in water, from the time they are hatched until they are killed, nor are they given as much as they care to drink, only a small quantity being supplied in tins about 6 inches deep; it is stated that if they are given more than that they will not eat nearly so well. The weights attained are as follows: Nine weeks, 5½ to 6 lbs.; ten weeks, 6 to 7 lbs., and they are killed at this stage. The breeds chiefly preferred are a cross between the Aylesbury and Pekin. Rouens and coloured ducks are not liked, because they are too dark in flesh. It is claimed that the Aylesbury and Pekin cross are a better shape and stronger than the pure Aylesbury. The greatest care is taken with the feathers of the ducks, and it is stated that these cover all expenses of labour, buying, selling, rearing, killing, and plucking. Considering the prices at which first-class duck feathers can be sold, this statement appears to be nearly correct. The birds are killed by breaking the neck, and are plucked immediately. They are shaped on flat boards, breast downwards.

"During the month of August, 1901, there were 5,000 birds upon this place, and at that period of the year 500 were being marketed every week.[*] The labour employed in killing, plucking, and packing, consisted of two men and five girls, and four men were employed in attending to the live birds. All the ducks are sent to one firm of dealers in the Central Market, London, and Mr. Murrell speaks of the treatment he has received from that firm in the highest terms. He states that the profit made upon the enterprise is equal to 6d. per bird.

"One of the most surprising points, and one which will appeal to multitudes of farmers throughout the country, is the effect upon the land itself. During my visit to this farm I was accompanied by one of the best farmers in the Woodbridge district, who knows the land very well; and he was astonished at the result. As already explained, each pen is enclosed within 50 yards of wire netting, 100 to 200 ducks being put into one of these pens, not so much according to the size, as to the number on hand at the time. They are kept there for a week, and then removed on to fresh ground. In that time every particle of grass is eaten off, and it might be thought that it would be destroyed. The change in the parts over which the birds have run is the most remarkable feature of the whole place. A week after the birds are removed, during at any rate the growing periods of the year, the ground is thickly covered with the finest grass, of a rich green colour, and thus from a poor useless piece of common land, a magnificent meadow has been made. It is not intended to put the ducks upon the same piece of ground again for five years. The land will be in grass during that time, and it is supposed that no more manure will be needed. It will be seen that this is rather antagonistic to Mr. Walsh's opinion that the effect is exhausted in two years, and probably one or the other may find it necessary to modify his opinion.[†] However, during the past season, in the prolonged drought, when there was no hay in the district generally, Mr. Murrell cut from 2½ acres ten tons of the finest meadow hay. It is evident from both statements that the manure from ducks specially feeds the finer qualities of grass, and enables these to displace the coarser growth.

"A year or two ago a somewhat pretentious attempt was made in Kent to establish another duck farm upon a large scale. Its manager had induced a gentleman living in Kent to invest about £2,000, very fine buildings being put up, large numbers of birds imported from America, and American incubators used. The returns, however, in hatching and rearing did not equal expectations, and up to the present this could not be cited as a successful duck farm. It has now passed into other hands, and its future will be watched with considerable interest."

In each of the recent developments here described American methods have obviously exerted considerable influence; and in this branch also of the poultry industry the greatest development has been in the United States, where there are numerous establishments that market from 10,000 to 15,000 birds annually,

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[*] It should be stated that this was far the highest number; and in fact the total for the entire season only reached 8,000, there being very few comparatively during the earliest and latest months. It will be obvious that if 5,000 were an ordinary number all through the season the acreage stated would not suffice for each pen to occupy the ground only one week in five years. More land is, however, available if required for extension.

[†] Mr. Murrell means in grass. Mr. Walsh probably means under arable cropping, which Mr. Murrell also believes would probably require fresh manure in two or three years.—E. W.

Duck-Farming in America.

and a fair number whose output is considerably more. A remarkable fact about this American industry is that the supply appears to have really created the demand, which the rapidly increasing population has maintained. The pioneers in it are admitted by all to have been Mr. James Rankin and Mr. A. J. Hallock, both of whom began to raise ducklings by artificial methods before 1860, and who soon found the business profitable, but for the fact that there was then little market. It was about 1876 before either raised any considerable number; and five or six years after that, when producing only about 1,500 per annum, Mr. Rankin records that he found these hard to sell, and had to solicit orders for them. But the public then began to appreciate fine ducklings, so that later on, when he reared 10,000, he could not supply the demand. The many others now in the business have also found, so far, that if the quality be good enough the demand and the price are both forthcoming. Some reasons for this immense demand have already been stated (see page 169), others being found in the well-being of the people, and the number of independent large cities widely separated, which do not centralise sales in one chief market as in London.

This great industry has been built upon the basis of the Pekin duck. Up to 1873 local farm ducks were crossed with Rouen or Muscovy drakes, Aylesburys being also tried, and crossed with Muscovy too, the last being generally considered best, but these best being small and carrying little meat compared with those now bred. In 1873 came Pekins, which at once were found superior, but still were very different from those of the present day, being longer and narrower in body, coarser in bone, and with far less development of flesh. The Pekin as now bred is much broader and thicker, and fuller in breast meat, with much less bone and offal in proportion, and also differs much from the bird as known in England at the present time. Possibly some of the early Pekins imported into America may have been somewhat superior to those brought to England; but it is doubtful, as Mr. Rankin states that thirty years ago it was difficult to find a young bird that could be got up to real weight at ten weeks old. It is more likely, perhaps, as the breed admittedly needs more space to grow in than the Aylesbury, that American conditions more favoured it. At all events, this breed of ducks has since been so improved in size, precocity, and fecundity, that ten-weeks drakes have weighed down 9 lbs. to 10 lbs., and ducks 8½ lbs.; that many ducks will lay, if the least forced, at five months old; and some raisers and many odd breeding pens average 150 eggs from each duck in a year. Owing to this advance ducklings now mature in three-fourths of the time formerly required. English Pekins are imported from time to time in order to furnish strong out-crosses, which as such are valued; but these birds have rarely if ever been found hitherto to equal in either size or shape the best American Pekins, as may be seen from the weights of breeding stock. Several of the largest American raisers, who keep 1,000 breeding ducks or more, find drakes weighing 12 lbs. quite common in their flocks; and one of them (Mr. Weber) when pointing the representative of a poultry journal to a certain flock of his breeders, numbering sixty ducks and a dozen drakes, made the statement: "Every *duck* in that pen weighs 10 lbs. or over." These results have been obtained by long and careful breeding, with special reference to fine market shape and quality of meat, avoiding that false idea of "keel" which has done so much harm in England. This English notion of "keel" (as bred for exhibition) does not seem understood by American breeders; for while Mr. Rankin writes expressly against "deep-keeled" birds, and describes a "wide, plump-breasted, and finely rounded contour," an article upon another great duck-rancher speaks of the "deep, long keel" of his stock, and again of the "depth of keel" in even the youngest birds. But there is appended to it a set of drawings of a pair of birds at every successive week of their age, and it is curious to observe that in spite of all this, *at no age is there the least keel* as understood by British exhibitors: the American writer and artist both mean merely a deep plump breast, covered with meat level to the top of the breast-bone, which every salesman knows to be the true model. American breeders, in short, have bred the Pekin systematically for fecundity, early maturity, and deep flesh on the breast; and the results are a striking testimony to their skill.

In management there are some differences amongst the largest raisers, though in most points there is practical agreement. The chief difference is that some provide ponds or other swimming range for their breeding stock, and a few even smaller puddles for their market ducklings, though nearly all raise the latter dry. Others, including some of the largest, have nothing but drinking troughs even for their breeders, and these are found fertile provided there is adequate yard-room for exercise. This is more matter of location than choice, however, and it is admitted by most that swimming-water really is better for fertility, and promotes stronger hatches. The almost universal proportion of breeders is one drake to five ducks; and the great majority keep five drakes and twenty-five ducks in one pen, those who have water often reducing the proportion with warmer weather to one drake in six or eight. Some, however, keep more together, penning forty or fifty or even sixty together. They are generally taken out from the general flock of breeders and mated up early in November. A very usual arrangement for the breeding ducks is a long large house with a passage up the centre, each side being divided into pens about ten feet square, which have outside yards of the same width and about 100 feet or more long, the water-range (where there is any) being at the bottom and also wired out in divisions.

The general diet for breeders is a mixture of one part of maize meal to one varying to two parts of bran, as the foundation; with this is mixed about 25 per cent. of cooked vegetables, 10 per cent. meat meal or "beef-scrap," and a portion of grit. This is fed twice a day, and in addition most give a good allowance of green food, such as cut cabbage, cut clover, or chopped green rye. This plenitude of green food, with adequate regular animal food, is an integral part of the system. It is found that any sudden change of diet affects laying very seriously, and that in particular a failure in supply of the beef-scrap so largely used, will, in two or three days, bring down the egg-yield by an alarming figure, and also affect the fertility.

Of the eggs incubated, on an average about 50 per cent. hatch, counting the whole season, the early eggs being, of course, less fertile than later on. A few do rather better, something depending upon the incubator used, and much more on the stock and the feeding. In considering this average, it must be remembered that it is the result of birds kept in many hundreds, and of eggs incubated in many thousands, in winter as well as in spring. When hatched, the ducklings are never left less than twenty-four hours, and more commonly thirty-six hours, without feeding; then transferred to brooders or brooder-houses, with the hovers kept at about 90° the first day or two, gradually reduced. After a week old, they are often shut away from the hovers in daytime on warm days, and may or may not be let out into small open yards in front of the pens, according to the weather. As soon as possible, they are got into cool brooder-houses, also divided into pens, and with yards in front of these averaging 100 feet long, each pen and yard carrying 50 to 100 ducklings, according to size. Some bed the covered pens with pine sawdust, others with shavings and chaff, or cut straw, and they are kept wholesome and dry.

All do not feed quite alike, though a general method prevails. Messrs. Seeley give for the first week equal parts of rolled oats and cracker (biscuit) crumbs, to which is added some chopped egg and some grit; for the next two weeks equal parts of rolled oats, cracker crumbs, maize meal, and bran, to which is added 5 per cent. of meat and 5 per cent. of chopped green food, with grit; then, till eight weeks old, equal parts of maize meal and bran, with 5 per cent. meat and green food as before; and the final two weeks before killing, two-thirds maize meal and one-third bran, with 10 per cent. of meat. Mr. Hallock's system is, for the first week equal parts of maize meal, bran, and coarse flour, with 10 per cent. coarse sand; thence till eight weeks, equal parts of same meals, but adding 10 per cent. beef-scrap, 12½ per cent. green food, and 10 per cent. sand; for the final two weeks, two parts maize meal, one part each bran and flour, 12½ per cent. beef-scrap, 12½ green food, and coarse sand as before. The general principle is to increase maize meal and meat during the finishing period, giving all through regular green food, and grit or sand. They are fed first every two hours, after a few days five times a day, gradually down to four and three times. The food is by some given in troughs, by others on boards; and water is kept close at hand, as Pekins appear to need to wash down every two or three mouthfuls; but many raisers do not leave water by them between meals. Milk to drink has been tried by some small raisers who had enough of it to make the experiment, but was found to get into the eyes and make them sore, and it is never given except in the food occasionally. "Bad eye" is also sometimes produced by over-crowding upon sawdust.

Pekin ducks are found to need special care in regard to several points. They are never caught or handled by the legs, which are very tender and easily sprained, especially with their great weight—always by the neck. They are also very timid and nervous, especially at night—if disturbed with a lantern it often upsets them for the whole night, and causes a set back in weight. If anything is done at night in the routine, it is usual to leave enough lanterns to see by, burning in their pens. Adequate shade is provided in hot weather by canvas or otherwise, hot sun being fatal; as also found in England. If any do really ail at all, the hatchet is usually applied at once, as possibly avoiding danger, and almost always saving trouble in the end. Besides "bad eye," and bowel complaints due to some mistake in feeding, the only other trouble usually met with is feather-plucking, the causes of which are either over-crowding, or a deficiency in meat-scrap and greens. As a general rule, the yards are finally vacated in August, being immediately ploughed over and sown with rye, which grows profusely and purifies the ground, as well as providing much green food in due time. When ready for market, the ducklings are usually killed in America by a knife stuck in the roof of the mouth. The weight at the universal ten weeks ranges from 10 lbs. to 13 lbs. per pair; but this depends upon the amount of food given and the weight really worked for, as much as upon the stock. The best-formed birds, meant for stock, are generally picked out at three or four weeks old, when transferred from the nursery brooders, and brought up with as much liberty as convenient in a somewhat hardier way.

Space will only allow of any details respecting a very few American duck-farms. These are not selected as being largest, there being several which raise more than most of those mentioned here, but partly for some variety of their circumstances or practice, and partly for the reputation of their owners as breeders; many of those who raise largely for market also having a reputation for eggs or breeding stock. And all are confined to establishments which have now had years of experience and continued success.

Some raise a relatively considerable number on a small space. Mr. George Pollard, well known as a breeder, raised 5,000 on less than two acres, and if he had continued with that plant, stated his ability to raise 8,000 on it, purchasing, of course, all the food; but he afterwards bought a sixty-acre farm as a larger ranche. It may be useful to state that he bought the small plant from an enthusiast who had rushed into it and sunk 5,000 dollars therein, selling out "on account of his health." As Mr. Pollard remarks, many others think like that young man, that it is an easy business and quick road to fortune; his stock had also become weakly from in-breeding. The experience of all the successful men is that duck-raising requires intense application and constant supervision; and many of the largest, who are making thousands of dollars a year by it, work sixteen and seventeen hours a day during the busy part of the season.

Mr. James Rankin, now eighty years of age, but quite recently retired from business, raised about 15,000 for market. He also sold 1,200 to 1,500 breeders at two to five dollars each, and in the last season of which we have any statement sent out about 50,000 eggs for hatching. He bred from about 1,000 stock birds, and these had no water except for drinking. The area not used for duck-yards was mainly devoted to growing green and vegetable food—rye, turnips, cabbage, clover, etc.—of which tons were accumulated to supply his breeders during the winter. Grit was constantly mixed in the food, in the proportion of 5 per cent. of its weight, and this practice is very general.

Mr. A. J. Hallock, of Speonk, Long Island, as before intimated, has also been in the business, or rather his father had before him, since about 1860. His ranche is about fifty acres, and all his stock have swimming-water. He markets annually nearly 70,000, and keeps 4,000 or more for breeders, the spare ones selling from two to as high as twenty-five dollars each, being well known as exhibition stock. He reckons his laying average at 135. Though many of the females are more, he prefers to breed from ducks about 8 lbs. and drakes 12 lbs., finding birds of 13 lbs. less satisfactory. He raises many chickens as well, and several years ago, when rearing considerably less than now, 3,000 lbs. of food was fed *per day* to the birds on this ranche, to facilitate which a rail or tram-line is carried across the yards, over the tops of the low fences. His breeders are weeded out after three years old, and such ducklings as may be behind in growth are put back betimes among rather younger ones, when they often catch up. He employs four or five men and a number of women.

One of the most successful duck-farms in the States is that of Messrs. Weber Brothers, at Wrentham, Mass. The father was a German, who with his sons struggled along on the farm with little success, till in 1888 they visited Mr. Rankin's duck-ranche, saw his results, and concluded to follow his example, raising in 1889 800 chickens and 500 ducklings. Though still 3,000 dollars in debt, they were so satisfied with the prospects that they bought two incubators holding 600 eggs each, and from forty breeders hatched in 1890 3,000 ducklings, marketing 2,800 and clearing over 1,500 dollars. That was their real start. Six years later, in 1896, they had paid off all debt and sunk 2,000 dollars more in plant, and that year from 500 breeding ducks hatched about 21,000, selling 19,000 and realising 7,000 dollars. In 1899 they raised about 35,000 ducklings, to produce which they employed 1,500 breeders, and were collecting from these six or seven bushels of eggs every day. The plant comprises several large brooder houses, cool houses, a grain house, a cooking house, incubator rooms, etc., and has an engine to pump water, cut bone, and do other work needing power. In the swing of the season, two tons of grain are used every day. The rest of the farm (*i.e.* not used by the ducks) is occupied in growing vegetables and green crops for them, which are immense, owing to the manure. Grass and rye mostly serve till late in the year, and when this fails the food is mixed with 20 per cent. of boiled turnips, beets, or carrots, except that two or three times a week they are given raw cabbages and turnips cut up. The breeders on this ranche have no ponds, but the egg-average is reckoned at 150; and in 1896, when they were carefully tabulated, the ducklings hatched amounted to 58 per cent. of the eggs put down.

The Trenton Farm, New Jersey, has marketed 20,000 to 30,000 ducklings for several years, but there are no details of special interest; neither have we seen any of nearly a dozen plants on a similar scale which might be cited. Mr. Charles Stauffer, of Harrisburg, Pa., hatched 30,280 in 1899, and actually raised just over 27,000 of them, figures which are interesting as illustrating the small mortality under good management. And Mr. W. H. Truslow, of Stroudburg, Pa., whose output is about 20,000, may be mentioned on account of his exceptional feeding — he feeds his ducklings on Spratt for the first five days, and half Spratt for the next five, after which the birds have about the usual rations.

It will be seen that American methods and results are well worthy of attentive study. It does not appear that in all points those results are superior. These breeders never possessed such Aylesbury stock as produces tender birds of 4 lbs. and more at eight weeks old; and we have seen also that of late British raisers have marketed Pekin crosses which have equalled the American average weight at ten weeks. But still heavier Pekin ducklings could be produced if there were demand for them; and when we read of *breeding* drakes weighing 12 lbs. and ducks 8 lbs. to 10 lbs., yarded in such flocks, and with such egg-averages, it is impossible not to be struck by the advance due to systematic breeding, according to a real "utility" standard. That these immense establishments breed their own stock, are self-contained and self-sufficient for all their wants except grain food, and occupy to profit permanent buildings of such a character, is also noteworthy. It by no means follows that in the milder climate of England such expensive plant is either necessary or desirable; but the importance of green food in the system, and the fact that the stock has been bred to such perfection by the great raisers themselves (who know the bird they want), will not fail to be remarked.

Very little need be said in regard to Continental duck-raising. By feeding with rice, and oatmeal, and white fat, more or less mixed with milk, some of the ducks fed in France and Belgium are made as smooth and white in skin as a La Flèche capon, and have attracted some attention at the Smithfield Table Poultry shows; but this kind of finish, so far as we can learn in the markets, is not much valued in England. In curious contrast to this is the fact that the celebrated French ducklings from the Rouen district, being killed by sheer suffocation (the bill being held shut and the nostrils covered) pluck dark and discoloured: but the black carbonized blood thus retained is held to give a higher flavour. More practically suggestive is the fact that these birds are without keel, and are fed so that the breast is full and level. That has a considerable value. In none of these ducks have we seen much evidence of distinctive race; but by care in selecting the stock of the district, they have been bred successfully for the same deep flesh on the breast which American breeders have so developed in the Pekin.

ORNAMENTAL DUCKS.

There are a large number of wild or natural varieties of ducks which are occasionally seen at exhibitions, and some of which are amongst the most beautiful in plumage to be found in the feathered world. These are bred more often by amateurs in Holland and Germany, and even in France, than in England, where less attention seems at present given to this class of birds than was even the case some years ago. We can remember seeing at Birmingham about 1875 really large classes of Black East India ducks, another good class of Mandarins and Carolinas, another of Call ducks, and yet another for any other variety: now the single class last mentioned is the only one generally found at even the largest shows. Some day perhaps the great beauty of many of these birds may revive their popularity.

They are not as a rule very easy to breed successfully, which may be one reason for their present scarcity; but any difficulty in merely keeping them has been exaggerated. One or two pairs may be kept in a comparatively small space, with a small pond; but, unlike other ducks, these kinds must have clean or fresh water: with only a stagnant puddle such as suffices large market ducks for weeks, these neither keep healthy nor can preserve their plumage. With adequate shade and a few shrubs and such a fresh pool, a pair or two of birds will keep in very good order and health; but to breed most of them, more should be provided. The water should for such a purpose be rather larger, and have tall rushes round it in some parts, or shrubs for shelter, with some grass, and the whole be fenced round. Where there is any danger from rats, inch-mesh netting should be carried all round a foot into the ground, which is generally effective; but fancy ducks are specially in danger from such vermin. If the pond is large enough to have a small island in the middle, or even a raft, all the better. If there are many shrubs and trees, it is better still; and besides the shelter given by these and the flags or rushes, small nesting boxes like little kennels may be placed about in sheltered places, and even a few up among low branches, where perching ducks like Mandarins or Carolinas are kept. Care should be taken not to startle or frighten them, and to feed them regularly, giving the adults grain in pans of water, and if in small yards adding duck-weed and some boiled liver chopped small: in larger enclosures they will forage greens and animal food for themselves. A few of the less wild and larger varieties, such as Bahamas, will range over a farm, and need give no trouble at all.

General Management of Fancy Waterfowl.

The eggs of small ducks mostly hatch in about twenty-five or twenty-six days, and do best under Silky hens. When hatched they should be cooped with the mother in a warm place, but provided with ample shade, with some clean turf in front, and be fenced in pretty near the hen for two or three weeks. They can be fed first on egg and bread-crumb and duck-weed or minced grass, gradually adding Spratt or meal, and a little minced boiled liver, or small worms, and small seeds and grain. They should not have too much water, and it is best given with duck-weed in it, which will supply small molluscs and other food as well, and helps greatly in rearing them. Gradually they come on to seeds and grain only, given in their water with the duck-weed, but clearing away all that is left every day.

There are two ways of confining them. If the enclosure is small, it is not very expensive to enclose it entirely with netting, either of wire or tanned twine. Otherwise, before they begin to fly the young birds must be pinioned. A sharp knife or strong pair of scissors is brought nearly close to the knuckle at the first joint of the wing, and cuts the latter off, carefully leaving on the limb the little projecting point carrying a plume of feathers, which will protect the part. Let the bird then dabble in cold water, and bleeding will quickly stop, or hazeline lotion may be applied.

Before exhibiting any of the more wild varieties, the pair should be confined two or three weeks in a quite small enclosure, also with its pond, but with comparatively little hiding place, that they may become tamer; and while thus taming, before transference to a pen, particular care should be taken not to frighten them. As a rule all the varieties, if well kept, improve in brilliance of plumage, and become more and more domesticated, the longer they live. A pair should never be exhibited unless they have mated, or at least lived together on friendly terms, as otherwise the drake may very likely kill the female, most of these ducks being very constant in their affections, and resenting any interference with them. This constancy to some extent facilitates hybridising, several of the small ducks being so much alike that if brought up on the same ground from the egg, they often attract males from kindred varieties.

From the immense number of beautiful waterfowl, distributed almost all over the world, we can only here briefly describe a few of the best known and most worthy of cultivation.

Call Ducks.

Call Ducks are small descendants of the Mallard, and formerly had a class at Birmingham, but are little kept now except in public parks. The Grey resembles the Rouen in colour, the White is white all over with a yellow bill. The bills and heads are shorter than the Rouen and Aylesbury, the forehead being rounded, or with considerable "stop" as it is termed. These birds breed freely, are very hardy, and may be kept at large.

Black East India Ducks.

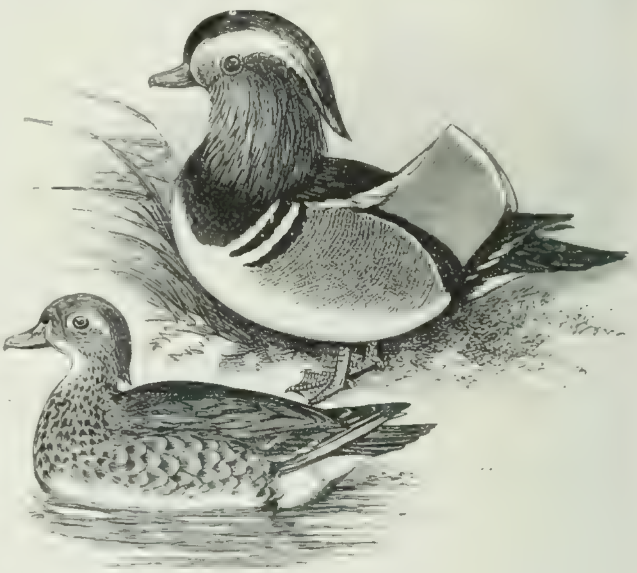
The Black East India duck, known also as the Buenos Ayres and Labrador, once filled large classes, but appears little kept now. It also descends from the Mallard, and is fertile with all ordinary breeds. It was a small duck, of plumage all black with intense and brilliant green lustre, and has been shown as small as 2 lbs. for the drake and 1¾ lbs. for the female, though most exhibition birds would reach 5 lbs. the pair. This duck is delicious eating, and hence was also bred, by scores, larger in size; these larger sizes being hardy, while the small were delicate. The delicacy of the smaller sized, and gradual crossing of the larger with the Cayuga, has almost exterminated this breed in England; but specimens still exist, and it could soon be recovered by judicious line-breeding. It can be kept at large, and intense green gloss is the chief exhibition point.

The Mandarin Duck.

The Mandarin duck (*Aix galericulata; Chinese Teal*) is confessedly the most ornamental of all waterfowl, the drake exhibiting almost all the colours of the rainbow. These birds are very small, but the most diminutive in size are never the best breeders, and it is also found that they grow rather larger with age and more thorough domestication. They are found in flocks between May and August in the countries watered by the river Amur, but are exceedingly difficult to approach or to capture. Those kept by Chinese mandarins are caught north of Pekin, so far as wild stock is concerned, but are also bred with great success, under the name of *Li-chi-ki.* They are highly prized both for their exceeding beauty and as striking examples of conjugal fidelity and affection, a pair being often carried in a gilt cage in marriage processions. The first known in England are described by Edwards in 1747 as at Richmond; forty years later they were at Osterley Park; and in 1833 they bred at the London Zoological Gardens. But all bred in Europe for many years were descended from a few procured in 1850 by Sir John Bowring, and two pairs which reached Rotterdam a year or two earlier. Since that time others have been imported.

In shape these birds are very compact, and slightly chubby. The drake's head has a large and long crest carried backward, which is erected or lowered at will, and green and purple on the top, shading off to rich chestnut and green. Along each side of the head, back into the crest, is a broad band of cream colour. The neck has round it a full ruffle of feathers rather like the hackles of fowls, but stiffer and more apart, of reddish glossy chestnut, which are termed "whiskers." The upper breast and shoulders are deep claret, terminated across each shoulder by two bars of black and white, the under parts being white; and the flanks are greenish yellow very finely pencilled with black lines. The back is light brown, the wing metallic brown quills with silver edging to the webs and tipped with blue, and with a purple bar. His greatest peculiarity lies in the wing-fans, the inner web of the inner feather of each wing being enormously developed into a sort of fan, which is carried up like a sail, and which is a rich brown edged with bright blue on one side and white on the other. The eye is black, the bill crimson, the legs pink, with yellowish feet. The duck also has a crest. Her beak is more of a horn colour, and her general plumage a sober greenish brown and mottling, except for eye-marks and a wing-bar. In summer the drake casts his whiskers and fans, and moults into summer plumage.

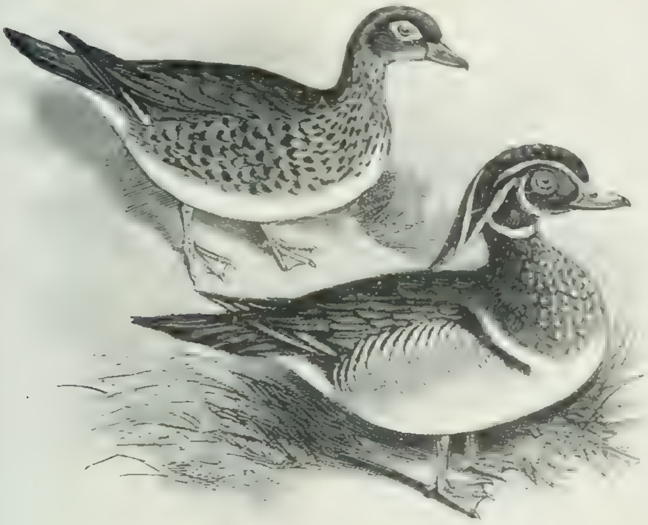
The Mandarin is naturally a percher, and will breed very well in a small house raised a little above the water, if necessary. The duck will lay two and even more nests of a dozen eggs each, white in shell. It is a pretty sight to watch them, the drake being obviously vain of his beauty, and the duck fondling his handsome whiskers, and the two "kissing" each other like doves. A pair may be kept and will breed in an enclosure eight or ten feet square, if arranged with a little care for appearances; but it is worthy of note that the produce so bred is not equal in furnishing or brilliance of colour to either imported birds, or those reared in wider and more natural surroundings. These general remarks apply also to the next variety.


Mandarin Ducks.

The Carolina Duck (*Aix sponsa; Summer Duck*, etc.) is a native of the United States, and also of the West India Islands. It, too,

The Carolina Duck.

is a percher or tree duck, often carrying its young to the water when hatched; and in the crest of the drake, the deep claret of the breast, the pencilled flanks, and the broad black and white shoulder-marks (though single in this case) there are evident signs of some former common origin, the lines of descent being probably connected through Behring's Straits. The wild birds also fly in flocks, though strictly pairing. The drake's head and crest are glossy green and violet, with pure white stripes arranged as in the illustration, the lowest forming a collar; the upper breast claret, but spotted prettily with white, the shoulder being crossed by a single bar of intense black and one of white; flanks a yellowish drab finely pencilled with black, and with pure white and black wider pencil marks along the upper margin (there are traces of these latter also in the Mandarin). The under parts are white, the back bronze and green, tail green-black, wings almost glossy black, with a bright blue and green ribbon-mark edged with white. The legs and feet are yellowish red, bill red margined with black, the eyes black in pupil with red irides. The duck has a much smaller crest, carried close, her back is a kind of glossy bronze, which extends more or less over the bird, the sides more of an ashy brown and drab, with spots near the breast. She has a white mark round the eye, which increases in size with age. Her quiet colours have, in spite of differences, great resemblance to the Mandarin duck, but she is rather brighter and more glossy. Owing to this resemblance hybrids or crosses sometimes occur.



Carolina Ducks.

The Carolina lays about the same as the Mandarin, but the eggs are more of an ivory colour. It generally grows slightly larger than that variety, and tends to increase in size when bred and fed in captivity, and these rather larger birds are usually the best breeders; but beyond reasonable latitude size should not be encouraged.

The Teals.

The entire family of ducks known as Teals are small and very pretty. The British Common Teal and the Garganey Teal are widely spread and very hardy, and breed well on any ornamental water. The Garganey (*Querquedula circia*) is the European representative of a group which is characterised by the upper shoulder-coverts of the wings assuming the form of broad pointed hackles. The most beautiful examples of this feature are the Japanese Teal (*Q. formosa*) and the Falcated duck (*Q. falcaria*).

The former of these is rare, but has been imported now and then: the first we ever saw were a splendid pair exhibited at the Crystal Palace in 1874. In some slight degree these had some general resemblance to the Mandarins, to which we should place them next in beauty. The top of the drake's head is black or dark grey, below which is a white streak just over the eye. From the eye descends nearly perpendicularly a black stripe, meeting a black patch under the throat, and enclosing a triangular white space in front of the face. Behind this stripe is another of white, behind which and backwards from the eye is a large crescent of bronze-green, the lower horns of which come forward and nearly meet in front of the breast. The breast is a light purple beautifully spotted with black, shading off to white on the under parts. The shoulders and flanks are a beautifully pencilled silver-grey with a broad white stripe or crescent on the shoulder at the same place as that on the Mandarin. The wing-spot is bronze-green, bordered above with brown and below with white. The tail and wings are brownish grey, but the shoulder or upper wing-coverts are long and pointed like hackles, and falling over the wings. These hackle-feathers are black in the centre, edged on one side with brown and on the other with white, and give a very handsome appearance. Under the tail is black. The female is a plain bird, not unlike the female Mallard. In habits the birds resemble the Mandarins.

The Falcated duck has similar hackle-like appendages to the wings. The drake is most beautifully pencilled all over the body with black on a silver-grey ground; the head purple, beautifully glossed with green, and having a crest of the same colour; the throat white, below which is a collar of green, and below that another ring of white. We have only seen one pair, which was at Manchester many years ago, and we are not sure they have yet been bred in this country.

The Shieldrakes.

The Shieldrakes, or Sheldrakes (*Kasarkas*), are large birds. Both the Common British Shieldrake and the Ruddy Shieldrake are hardy, handsome, readily domesticated, and can be fed in a farmyard with other poultry, though apt to be a trifle spiteful now and then, which seems general in the family. They also do well in a garden, if there is even a very small pond. The wild birds often nest in rabbit-holes; farm-reared ones may nest almost anywhere, and may sometimes be seen in the act of carrying their young to the water in their bills. They are not well adapted to excessively small runs.

Of foreign Shieldrakes, the best known is the Paradise duck (*K. variegata*) of New Zealand, remarkable for the extraordinary difference between the colours of the two sexes. The drake's head is glossy green black, while the duck's is pure white: his body is mainly a dark pencilled grey, with deep bronze stern; she has a great deal of white and red, with some of the pencilled grey intermingled. This duck often took prizes some years ago. A larger and more beautiful bird is the Australian *K. tadornoides.* The drake has dark hazel eyes and a black beak, black head and neck, below which comes a clean white collar, then succeeds a ruddy brown, gradually lightening; round the top of back and centre of breast another white collar runs completely. The body is mainly a silvery grey; the wings white on the shoulder, blue in the bar, and black in the flights, with a curious expanded feather on each side in the same place as the Mandarin's fan, but lying flat over the rump, and chestnut in colour with a white edge. This is perhaps the noblest in appearance of all the ducks.

The largest of the Shieldrakes is known as the Egyptian Goose, which is not a goose at all, though known as such for hundreds of years. Years ago we noted its affinity to the Shieldrakes, and that it had bred with even common ducks; it bred with Shieldrakes at Regent's Park Gardens in 1887, and again in 1901 similar hybrids were produced in one of the London parks, we think the St. James's. It has been seen flying at large in England. It is tame, but quarrelsome in a yard, and does best on the water of a park, where it will breed freely.

The drakes of this family do not moult into female plumage in the summer.

The Pintails.

The Pintail family (*Dafila*) are named from their long pointed tails. The Common Pintail is a British bird, the drake being distinguished by long pointed shoulder-hackles, which are black edged with pale buff. The head is dark brown with bronze or purple gloss, the breast white, tail black, back and flanks silver-grey, formed by beautiful fine black pencilling on white ground; the wing-bar brilliant green. The bill is lead colour. The female is brown, edged with lighter colour. This duck breeds freely, and often hybridises with others.

There are two foreign varieties often seen. The Chilian Pintail is small, very long and slim in shape, and rich but quiet in colour, varying from chestnut to fawn, the drake's back being brown edged with black, and his wing-bar blue. The most beautiful and popular is the Bahama Pintail, which is a perching bird where it has a chance. The bill and feet are lead colour, the head deep glossy brown, the general colour cinnamon, passing on the breast to greyer colour spotted with black, the tail deep bronzy cinnamon, the shoulder feathers black edged with chestnut; both sexes are nearly alike. This pretty duck is hardy and prolific, and, as already noted, will range over a farm.

Whistling Ducks.

Of the Whistling ducks (*Dendrocygna*) only two varieties are commonly seen, and may be mentioned as specially adapted, from their tameness, to be kept in any small grass run with a little pond at the bottom of a garden, requiring no special privacy to thrive. They do not, however, breed well in this climate, and require a tight shed or house in the winter.

The Widow duck (*D. viduata* = "little widow") has rather long, thin, lead coloured legs, and stands very upright, the feet having less web and more claw than usual. The bill is nearly black, the head from base of bill to behind the eyes white; back of head and neck black, with a patch of white rather below the throat; all along centre of breast and belly black; the feathers of back and shoulders dark brown edged with lighter colour, tail black, rest of flanks and shoulders mostly brown pencilled across with black. Both sexes are marked alike. The Red-billed Whistler (*D. autumnalis*) has a red bill and pinky legs, crown of the head chestnut, cheeks and throat greyish white, lower neck and back and shoulders chestnut well bronzed, the belly, thighs, and tail black.

Other Varieties.

Of varieties usually exhibited, the only other calling for special mention is the Indian Spotted Bill duck. This is a true duck of the *Anas* family (*A. pœcilorhyncha*). It breeds freely, and often crosses with others in a pond, especially with the Mallard—it is, in fact, the wild duck of India. The bill is black, with a red border at the base and a bright yellow spot at the tip. The drake's head is brown, his breast paler brown with dark brown spots, or dark brown broadly edged with pale, the back rather darker, till the tail and stern become black. The wing-bar is probably the most brilliant green possessed by any duck, with a band of black and white above and below. Both sexes are nearly alike, but the duck rather duller in colour. This duck has been by turns very popular, and again quite neglected. We remember the few then in England once selling readily at £10 for a pair.

Several other of the wild British ducks are very handsome, and though not adapted to close confinement or exhibition, are often seen on ornamental waters in parks and public gardens. The short and chubby Pochards are often kept thus, being generally known as "diving ducks," and watched with interest on that account. The Shoveller and Common Wigeon are frequently thus seen. Many of the wild "British" varieties can often be obtained at a cheap rate in Leadenhall Market, or at the annual sales of waterfowl now held by the managers of the larger public parks. They need for successful breeding the natural surroundings and range mentioned at the commencement of this section, and to be left much to Nature, and are not adapted for small runs.

In judging the larger kinds of ducks, the chief duty of the judge is to distinguish between mere cramming or gorging of the crops just previous to his awards, and real size and weight of frame. Much harm has been done even by the recognition of a degree of fattening which ruins the birds as breeders. The Standards of the Poultry Club for the recognised classes sufficiently deal with other points, and are as follows:

AYLESBURY DUCKS

GENERAL CHARACTERISTICS

Head.—Large, straight, and long. *Bill:* Long and broad, and when viewed from the side the outline almost straight from the top of the skull, the head and bill measuring from six to eight inches. *Eyes:* Full.

Neck.—Long, slender, and slightly curved.

Body.—Long, broad, and very deep. *Breast:* Full and prominent. *Keel:* Quite straight from breast to stern. *Back:* Straight and almost flat. *Wings:* Strong, and carried closely to the sides; fairly high, but not touching across the saddle. *Tail:* Short, only slightly elevated, and composed of stiff feathers, the drake's having two or three well curled feathers in the centre.

Legs and Feet.—*Legs:* Very strong and short, the bones thick, well set so as to balance the body. *Toes:* Straight, connected by web.

Carriage.—Horizontal, the keel practically parallel with the ground.

Weight.—*Drake:* 10 lb. *Duck:* 9 lb.

Plumage.—Bright and glossy, resembling satin.

COLOUR

Bill: Pink-white, or flesh. *Eyes:* Dark. *Legs and Feet:* Bright orange.

Plumage.—Pure white.

SCALE OF POINTS

Head and bill	20
Size	20
Condition	12
Keel	10
Colour	10
Type	10
Eyes	8
Neck	5
Legs and feet	5
	100

Serious defects: Plumage other than white; bill other than white or flesh colour; crooked back, wry tail, or any other deformity; ducks so heavy behind that in the opinion of the judge they will not breed.

CAYUGA DUCKS

GENERAL CHARACTERISTICS

Head.—Large. *Bill:* Long, wide, and flat, well set in a straight line from the tip of the eye. *Eyes:* Full.

Neck.—Long and tapering, and with a graceful curve.

Body.—Long, broad, and deep. *Breast:* Prominent; keel well forward, and forming a straight under-line from stem to stern. *Tail:* Carried well out and closely folded, the drake's having two or three well curled feathers in the centre.

Legs and Feet.—*Legs:* Large and strong boned, placed midway in the body, giving the bird a carriage similar to that of the Rouen. *Toes:* Straight, connected by web.

Carriage.—Lively, clear of the ground from breast to stern.

Weight.—*Drake :* 8 lb. *Duck :* 7 lb.

Plumage.—Bright and glossy.

COLOUR

Bill : Slate-black, with dense black saddle in the centre, but not touching the sides nor coming within one inch of the end ; the bean black. *Eyes :* Black. *Legs and Feet :* Dull orange-brown.

Plumage.—Lustrous green-black, as free as possible from purple or white, the whole of the back and upper part of wings, the breast, and under-parts of body deep black, the wings naturally more lustrous than the rest of the body plumage ; a brown or purple tinge is objectionable, although not a disqualification.

SCALE OF POINTS

Type	30
Size	20
Colour	15
Head and bill	10
Condition	10
Neck	5
Tail	5
Legs and feet	5
	100

Serious defects : Red or white feathers ; orange-coloured bill ; dished bill ; crooked back, wry tail, or any other deformity.

CRESTED DUCKS

GENERAL CHARACTERISTICS

Head.—Long and straight. *Crest :* Globular, as large as possible, and set evenly on the skull. *Bill :* Long and broad. *Eyes :* Large and bright.

Neck.—Rather long, slightly arched.

Body.—Long, broad, and fairly deep. *Breast :* Full and round. *Back :* Long and broad. *Wings :* Strong, and carried closely to the sides. *Tail :* Short, similar to that of the Aylesbury.

Legs and Feet.—*Legs :* Short and strong. *Toes :* Straight, connected by web.

Carriage.—Somewhat erect.

Weight.—*Drake :* 7 lb. *Duck :* 6 lb.

COLOUR

Any colour is permitted.

SCALE OF POINTS

Crest	25
Type	20
Size	15
Head and bill	10
Colour	10
Condition	10
Neck	5
Legs and feet	5
	100

Serious defects : Slipped wing ; any deformity.

INDIAN RUNNER DUCKS

GENERAL CHARACTERISTICS

Head.—Long, fine, and comparatively flat. *Bill :* Very long and strong, fairly broad, coming straight down from the skull and giving it the appearance of a long wedge : the long sweep of the top line of the head should continue without an indentation or stop right down to the end of the bill, and should not dip in the centre (known as " dished "). *Eyes :* Set high in the head.

Neck.—Long, and as thin as possible.

Body.—Long, narrow, and racy-looking. *Breast :* Round. *Shoulders :* Gently sloping, gradually tapering upward until they reach the neck. *Wings :* Of medium length and closely carried. *Tail :* In a line with the body, the drake's having two or three curled feathers. From the shoulders the body is drawn out at length, tapering gradually to the stern, and without the slightest indication of keel, the top and lower halves resembling each other in shape, and appearing as two symmetrical ovals. (NOTE.—A good description of the general shape of the Indian Runner is that it resembles that of the old style of soda-water bottle.)

Legs and Feet.—*Legs :* Of medium length, set well back and compelling the bird to carry itself upright. *Toes :* Straight, connected by web.

Carriage.—Very erect, somewhat after the form of a Penguin.

Weight.—*Drake :* 4½ lb. *Duck :* 4 lb. Weight in either sex not to exceed 5½ lb., nor to be less than 3½ lb.

COLOUR

Bill : Yellow, and spotted with green in young birds ; entirely green in adults, and with a black bean. *Eyes :* Hazel. *Legs and Feet :* Deep and bright yellow.

Plumage.—Fawn and white. *Head :* Cap and cheeks fawn, a narrow line of white dividing those markings, and a line of white about one eighth of an inch wide dividing the base of the bill from the head markings. *Neck.*—White from the head to 1½ to 2 in. from the base of the neck, where it joins the fawn evenly and abruptly all round, the lower part of the neck fawn. *Breast* (upper part, about half-way between the point of the breast-bone and the legs), *Shoulders, Wings* (top part), *Back, and Tail :* Fawn. *Flights and Fluff :* White, except an indistinct line of colour running from the base of the tail to the thighs. The colour should be uniform throughout the whole of the surface plumage, except the tail of the drake, which is of a dark shade. The fawn of the shoulders, the top part of the wings and the tail is the shape of a heart pressed flat on the back. The two colours throughout should be cleanly cut, and not running into each other.

SCALE OF POINTS

Colour and markings : body, 25 ; head, 10 ..	35
Type and condition .	35
Head, eyes, and bill .	15
Neck	10
Legs and feet .. .	5
	100

Serious defects : Blue ribbon wing bars ; flat breast ; horizontal shape or carriage ; absence of feathers from the wings or any other part of the body ; slipped or twisted wings ; wry tail ; or any other deformity.

ORPINGTON DUCKS

GENERAL CHARACTERISTICS

Head.—Fine, and of oval shape. *Bill :* Of moderate length and in a straight line from the skull. *Eyes :* Bold and full.

Neck.—Fairly long and gracefully curved.

Body.—Long, broad, and deep. *Breast :* Full and round. *Wings :* Strong, and carried closely to the sides. *Tail :* Small, and rising gently, the drake's having two or three curled feathers in the centre.

Legs and Feet.—*Legs :* Strong and set well apart, of medium length. *Toes :* Straight, connected by web.

Carriage.—Somewhat upright.

Weight.—*Drake :* 7 lb. *Duck :* 6 lb.

Plumage.—Bright and glossy.

COLOUR

THE BUFF

Bill : Yellow, with dark bean. *Eyes :* Brown iris, blue pupil. *Legs and Feet :* Bright orange yellow.

Plumage.—Rich shade of fawn, even throughout, the head and the upper portion of the neck of the drake at least two shades darker than the body colour.

SCALE OF POINTS

Colour	30
Type	25
Size	25
Head	10
Legs and feet	10
	100

Serious defects : Colour other than buff ; lack of size ; twisted wings ; wry tail ; or any other deformity.

PEKIN DUCKS

GENERAL CHARACTERISTICS

Head.—Large, broad, and round, with high skull, rising rather abruptly from the base of the bill, and heavy cheeks. *Bill :* Short, broad and thick, slightly convex but not dished. *Eyes :* Partially shaded by heavy eyebrows and bulky cheeks.

Neck.—Long and thick, carried well forward in a graceful arch or curve, and with slightly gulleted throat.

Body.—Broad and of medium length, and without any indication of keel except a little between the legs. *Breast :* Broad and full, followed in underline by the keel (which shows very slightly between the legs) to a broad, deep paunch and stern, carried just clear of the ground. *Back :* Broad. *Wings :* Short, and carried closely to the sides. *Tail :* Well spread and carried high, the drake's having two or three curled feathers on top. (NOTE.—A good description of the general shape of the Pekin is that it resembles a small wide boat standing almost on its stern, and the bow leaning slightly forward.)

Legs and Feet.—*Legs :* Strong and stout, set well back and causing erect carriage. *Toes :* Straight, connected by web.

Carriage.—Almost upright, elevated in front and sloping downward to the rear.

Weight. *Drake :* 9 lb. *Duck :* [illegible] lb.

Plumage.—Very abundant, the thighs and fluff well furnished with long, soft, downy feathers.

COLOUR

Bill : Bright orange, and free from black marks or spots. *Eyes :* Dark lead-blue. *Legs and Feet :* Bright orange.

Plumage.—Buff canary, sound and uniform, or deep cream, the former preferred.

SCALE OF POINTS

Type	25
Size	20
Head : bill, 10 ; eyes, 5	15
Colour	15
Condition	10
Neck	5
Tail	5
Legs and feet	5
	100

Serious defects : Black marks or spots on bill ; white plumage ; wry tail ; or any other deformity.

ROUEN DUCKS

GENERAL CHARACTERISTICS

Head.—Massive. *Bill :* Long, wide, and flat, well set on, in a straight line from the top of the eye. *Eyes :* Bold and bright.

Neck.—Long and tapering, slightly curved but not arched, carried erect.

Body.—Very long, broad and square, very deep keel just clear of the ground from stem to stern. *Breast :* Broad and deep. *Back :* Long. *Wings :* Large and well tucked to the sides. *Tail :* Only slightly elevated, the drake's having two or three curled feathers in the centre.

Legs and Feet.—*Legs :* Of medium length, large boned, well set, so as to balance the body in a straight line. *Toes :* Straight, connected by web.

Carriage.—Horizontal, the keel practically parallel with the ground and just clear of it.

Weight.—*Drake :* 10 lb. *Duck :* 9 lb.

Plumage.—Bright and glossy.

COLOUR

THE DRAKE

Bill : Bright green-yellow, with black bean at the tip. *Eyes :* Dark hazel. *Legs and Feet :* Bright brick red.

Plumage.—*Head and Neck :* Rich iridescent green to within about an inch of the shoulders where the ring appears. *Ring :* Perfectly white and cleanly cut, dividing the neck and breast colours, but not quite encircling the neck, leaving a small space at the back. *Breast:* Rich claret, coming well under; cleanly cut, not running into the body colour, and quite free from white pencilling or chain armour. *Chain Armour or Flank Pencilling:* Rich blue French-grey ground, well pencilled across with glossy black, perfectly free from white, rust, or iron. *Stern:* Same ground as flank, very boldly pencilled close up to the vent, finishing in an indistinct curved line (perfectly free from white) followed by rich black feathers up to the tail coverts. *Tail coverts:* Black or slate-black, with brown tinge, with two or three green-black curled feathers in the centre. *Back and Rump:* Rich green-black from between the shoulders to the rump. *Wings:* Large coverts, pale clear grey; small coverts, French grey very finely pencilled; pinion coverts, dark grey or slate black; bars (two, composed of one line of white in the centre of the small coverts), grey tipped with black, also forming a line at the base of the flight coverts, the latter feathers slate-black on the upper side of the quill and rich iridescent blue on the lower side, each of these feathers tipped with white at the end of the lower side, forming two distinct white bars (the pinion bar being edged with black) with a bold blue ribbon mark between the two, each colour being clear and distinct and making a striking contrast; flights, slate-black with brown tinge free from white. The markings throughout the whole plumage should be cleanly cut and well defined in every detail, the colours distinct and not shading into each other.

THE DUCK

Bill: Bright orange ground, with black bean at the tip, and with black saddle extending almost to each side and about two-thirds down towards the tip. *Eyes:* Dark hazel. *Legs and Feet:* Dull orange brown.

Plumage.—*Head:* Rich (golden, almond, or chestnut) brown, with a wide brown-black line from the base of the bill to the neck, and very bold black lines across the head, above and below the eyes, filled in with smaller lines. *Neck:* The same colour as the head, with a wide brown line at the back from the shoulders, shading to black at the head. *Wings:* Bars, two distinct white bars with a bold blue ribbon-mark between, as in the drake; flights, slate black with brown tinge, no white. *Remainder of Plumage:* The ground of rich (golden, almond, or chestnut) brown of level shade, every feather distinctly pencilled from throat and breast to flank and stern, the markings to be rich black or very dark brown, the black pencilling on the rump having a green lustre.

SCALE OF POINTS

THE DRAKE

Colour: breast, 10; bill, 5; neck, 5; ring, 5; chain armour, 5; back and rump, 5; wings, 5; stern, 5; tail, 5	50
Markings	10
Size	10
Type	10
Condition	10
Head	5
Legs and feet	5
	100

THE DUCK

Colour: ground, 15; bill, 10; head, 5; neck, 5; wings, 5	40
Pencilling	20
Size	10
Type	10
Condition	10
Head	5
Legs and feet	5
	100

Serious defects: Leaden bill; no wing bars; white flights; broken down in stern; wings down or twisted; wry tail; or any other deformity. In the drake no ring on neck or black-saddle or bill; in the duck, white ring, or approaching white, on neck.

OTHER BREEDS

Beyond the foregoing mentioned breeds of ducks those occasionally seen at exhibitions in this country are East Indian (Black), Muscovy (Black-and-White, and White), Swedish (Blue), and Ornamental varieties, such as Bahamas, Calls, Carolinas, Mandarins, Spot-Bills, Shovellers, and Whistlers; but they are not kept or exhibited in sufficient numbers to warrant descriptive standards.—W. W. B.

CHAPTER XXXVIII.

GEESE AND SWANS.

SEVERAL wild breeds of Geese are more or less spread over Europe and northern Asia and America; but there is no doubt that all of the domestic varieties are descended from the Grey-lag (*Anser cinereus*), which alone still breeds in Scotland and our northern islands, and also breeds freely with the domestic races and produces fertile progeny. This bird ranges as far as northern India, and has an orange bill and general resemblance to the common grey geese of many farm-yards, though smaller and lighter in build. It is singular that the most common goose now found wild in Britain is the somewhat smaller Bean goose, which has longer wings and a shorter bill, but is only a winter visitant; as is also the Pink-footed goose. Both these may be allied to the Grey-lag, and have hybridised with it; but the other best-known wild geese, the very dark grey Brent goose, and the Bernacle goose, which has grey sides with each feather banded with black and white, appear to be more allied to the Canada goose presently mentioned, and most of their recorded hybrids have been with that bird.

Wild geese resemble the wild ducks in their habit of flying, which is in a V-shaped phalanx, even more decided than in those birds; but they differ materially in habits and diet, which difference is still more accentuated in the domestic races. While the duck is a very omnivorous and somewhat foul feeder, but requiring a pretty large proportion of animal food, the domestic goose especially, and the others less so, seeks a vegetable diet, and is a very clean feeder. Some of the wild birds feed largely upon water-weed, but the domestic breeds chiefly graze upon land. The period of incubation is about thirty days; rather less in the smaller birds.

General Management of Geese.

Geese pay best to rear in an ordinary way, where access can be had to commons or waste lands, as then the stock birds will only need a little grain in the morning, and graze for themselves the rest of the day. It is not advisable to run them very thickly upon good pasture, as they eat it freely, and crop the grass even closer than a sheep, and would rather "sour" the land for that year by their manure; but in smaller number they are a benefit to it, and grazing stock often thrive better, as they are found to eat off the seeds and ergot of the rye-grass. For housing they should have a comfortable shed large enough for the number kept, well bedded down with straw, and in which it is better to keep them confined in the breeding season until they have laid, as the female is rather apt to try to steal a nest abroad if there is any chance. They spend so much time in grazing on land, that large swimming range is not required, though they enjoy it: they can do with even a very large tub sunk in the ground, but it must be large enough and deep enough for them to bathe themselves in thoroughly, and of course a pond is better.

A gander is generally mated with three geese, and they should be put together not later than the new year. A month or two earlier is much better, and would prevent many disappointments, as explained more fully further on. For very early breeding young geese must be used, and usually lay in February; but the strongest birds are bred from females a year older. They have been known to breed till thirty and even forty years old, and are often kept on farms for twenty years and more; but old ganders generally become very fierce and dangerous to children long before that, and have to be killed. Breeding stock must not be allowed to get over-heavy during the winter, but, on the contrary, kept rather thin and spare. All eggs should be taken away as laid, in order that they may lay as many as possible. Some breeders set all the eggs under the largest hens procurable, which will cover about five: in which case the eggs must be well sprinkled, or the nest well watered, which is better. Others let the goose (unless a Toulouse) also sit when she desires, giving her a roomy nest in a damp place. The gander will often stay an hour or two by a sitting goose, and when she is sitting the birds must not be disturbed, at least by a stranger, or the male may attack, and a blow from his wing is capable of breaking an arm. The eggs hatch at or before the expiration of thirty days. They also do very well in an incubator, or under turkey hens.

A goose which has hatched a family is best cooped out when they are about twenty-four hours old under a large crate, on dry ground, but sufficiently shaded, as goslings cannot stand the sun. No coop for them should have a wooden floor, as their feet seem to slip about on this in a strange way, and they may get their leg-joints dislocated. For about a week it is well to keep the goslings confined in a run; but after that they begin to graze and forage, and may have liberty, provided they are housed and well bedded down at night. They need no brooding after that age if properly sheltered, but the natural parents take great interest for a long time in the young family, which on a good grazing ground will need scarcely any other attention until nightfall. Incubator-hatched goslings do quite well in an outdoor brooder, cooled down as soon as possible.

They may be fed the first day on chopped egg and bread-crumb like ducklings, but mixed with some chopped weed or greens, which they need from the very first. After that there is no better diet than barley-meal and wheat, scalding the wheat with boiling water and mixing rather dry meal with it: any boiled greens and vegetables may be mixed with it, and minced grass, or boiled potatoes. The drinking water should be in a fountain into which they can only get their bills. When strong, they need very little food if there is good grazing, so that formerly many were killed at Michaelmas just as they came from the grass, as "green" geese. When kept after that for greater size, they are usually either turned into stubbles, or folded on a piece of turnips to eat it off like sheep—eating off the greens themselves, and having the roots chopped in two for them, or put up to fatten in sheds. During such fattening they are usually fed three times a day, having by them clean water and a tub of coarse gravel. The finest flesh is probably produced by whole or crushed white oats in water; but they will fatten more quickly on a mixture of fresh brewers' grains and barley-meal, or with some Indian meal. They are more contented if some sweet hay is fastened up so that they can nibble at it, but not get it down under foot; and so far as possible, only the number should be penned together which are likely to be killed together, since they form strong companionships, and are apt to fret and "go off" if a portion of the flock are taken away. As a rule it pays best either to keep them on till near Christmas, if there are stubbles to run them on; or else to fatten them up as quickly as possible for market; or else, spending less upon them, to sell them in good condition, but small, as indicated later on.

In regard to exhibition, nothing need be added to the articles which follow respecting the chief varieties of geese. For practical purposes these consist of the Embden, the Toulouse, the Chinese or African, and the Canada goose; the first three of which are descended from the wild Grey-lag, while the Canada is distinct. The ordinary domestic goose has also given rise to one or two sub-varieties.

The Embden Goose.

The most valuable breed of geese at the present day, for reasons stated presently, is probably the Embden. The following article on Embden geese was kindly contributed by the Hon. Sybil and Florence Amherst, who was until recently well known as a successful breeder and exhibitor of this variety.

"The development of the white domestic goose can be traced from the earliest times. Before show Standards required certain geese to be 'spotless white throughout,' it had been the study of breeders, from the remotest ages, for utility purposes, to establish white varieties of geese. An account is given on a papyrus[*] of an Egyptian prince, who, in ordering ten geese to be given as payment to his workmen, cautions those who are to kill the geese not to touch 'the white bird on the cool tank.' In much later times, large flocks of white geese were driven to Rome from north-western Europe for the sake of their feathers. According to Lucretius, the sacred geese that saved the Capitol were white. Horace[†] describes a famous Roman dish made of the liver of white geese fed on fat figs. Varro, about 50 B.C., urges that geese chosen for stock should be large and white,[‡] for the goslings are generally like them, and points out the advantage of their 'domesticated, placid nature.' Columella, in the beginning of the Christian era, writing on the same subject, remarks[§] that 'care must be taken that male and female of the largest bodies and of a white colour be chosen' (avoiding the wilder grey kinds). These scattered notes show that it has been by careful selection that pure white breeds of geese have been formed.

"The work of generations is shown to perfection in the Embden goose as now bred and exhibited in the United Kingdom. All nations recognise the creation of this beautiful bird by the English. In Germany, the original home of the Embden, they say, 'Embdens were exported to England a long time ago, and how admirably they have succeeded, and surpassed

[*] Anastasi Papyrus.
[†] Sat. Lib. viii. 66.
[‡] Lib. iii. cap. v.
[§] Lib. viii. cap. xiv.

us with this variety, is well known.' The present race is called 'the new English breed,' and as it exists now, is not known in Germany, except as imported from England; and, 'For the last ten years there has been no chance of obtaining a prize at any exhibition for the old type of Embden.' English exhibitors, who have seen the older German Embdens at shows on the Continent, also say, 'They are correct in shape, but too small to compete with our birds.'

"The old Continental Embden goose, or as it is spelt in Germany, Emden (*Anser dom. frieslandicus*), is sometimes, though wrongly, called the 'Bremen' goose. It derives its name from the town of Embden, having been bred in East Friesland, in the valley of the River Em, and the adjoining Jeverland, from time immemorial. The export of feathers from East Friesland to the Levant in very early days formed an important trade, and the rearing of geese on the coast, in the regions of the River Em, for centuries was extensive; but the area of its activity from floods and other causes gradually decreased, and it is now only carried on in two little villages, Riepe and Simonswolde, two or three hours distant on foot from Embden. At the present day, in the middle of May, Embden goslings of four to five weeks old are sent from that district to all parts of Germany, and also to other countries, principally Hungary, Bohemia, and Russia. Eggs for sitting are also sold at high prices, and there is a large export of feathers.

"There is a myth in Friesland, that the geese in olden days were grey, but that a wild swan, which had come among them unnoticed, paired with a goose, and this was the origin of what, in those parts, they call their 'Embden swan geese.' Apart from this myth, it is a fact that Continental Embdens in moulting go through a change of colour like a swan, being, it is said, the only tame goose that thus changes its plumage. As soon as they grow their quills, they show more or less grey feathers (sometimes pure white young ones are seen, but they are invariably ganders), a bird not becoming pure white till its second autumn moult. In pure Embdens as now reared in England, grey feathers in young birds occasionally appear (which they lose after their first moult), but careful breeders avoid these swan-like propensities. It is considered quite wrong for a young prize-bred Embden to have any grey feathers, as these also mark a cross with the Toulouse. The naturalists of Embden, and others, do not consider the Embden represents a distinct breed. The geese on the north coasts of Holland and north-western Germany, and the white Flemish goose bred in Belgium and northern France, may all be considered to be of much the same race. The ordinary birds of Friesland also resemble in many respects the variety known as Pomeranian, especially when the latter are white.

"It is impossible to state when Embden geese were first imported into England. In the beginning of the last century a great deal of poultry was reared in Nesserland, close to Embden, and as there was a brisk trade in fowls between England and Embden, it is probable that geese were also imported. Mowbray remarks, 'At present (1815) Embden geese are in the highest esteem,' but respecting their table qualities he adds, 'I am unable to say, having yet had no experience in this variety.' From this latter remark it might be inferred that this variety was a somewhat new addition to English geese. English writers about fifty years ago say these geese had been imported 'some time ago' from Embden in Hanover, and also from Holland, and at the time they wrote birds were still being largely imported. They state that Embdens differed in no way from our white geese in England 'except from their great size and uniform clear white plumage.' Pure stock was kept, and they were largely used for crossing to improve our common white geese. The breed, as it exists at present, owes something to a cross with Toulouse geese, the object having been to increase the size, while still trying to retain intact the distinctive attributes of the Embden breed.

"Embden geese were exported from Germany to America in 1821 as 'Bremen' geese, but the letter relative to the care of the geese on the voyage, addressed to the captain of the ship, was dated from Embden, showing Bremen to have been merely the port of embarkation. In 1852 a pair were again sent to America as Bremen geese. Some were exported direct from Embden in 1882.

"The advantage of Embden geese over Toulouse in rearing is, that while the Toulouse perhaps is susceptible to greater growth for extra care, the Embden is better grown under neglect than the Toulouse. Embdens are very good foragers, and by this means assist in keeping down the food bill. The chief advantage of Embdens, however, is their rapid growth. They are well grown and ready for killing at an earlier age than are the Toulouse, and thus Embden goslings can be got ready for the 'green' goose trade in the autumn, which is impossible with the Toulouse. Embdens look their best for table just before Christmas, when their feathers are well up. Owing to their white plumage they dress more quickly, and look very superior to coloured geese. A large dealer states that if other qualities are equal, he would give preference to white geese. The flesh is of finer quality, and lighter in colour. When cleaned and dressed and cooked, the Embden loses less weight in proportion than the Toulouse. The marketable value of white feathers is also a consideration, the value being certainly 2d. or 3d. per lb. more than the coloured ones, and white down is worth 2s. 6d. per lb. The five first wing feathers are quills, and have a certain value, though not so much as formerly. For utility purposes and quick fattening, however, a cross between an Embden gander and a Toulouse goose is often found most valuable.

"Ganders and geese are at their best for stock from two to ten years old. They live to a great age—it is stated to thirty or more years—but after ten years they cannot be reckoned upon as reliable assets on a farm. Two years old is the best age to mate them, making up pens of a gander and two or three geese at the New Year. It is difficult sometimes to distinguish ganders from geese. A practical man is, however, rarely mistaken. Some say they make a different noise. The size and thickness of the neck is some indication. You can generally distinguish the young birds about Christmas time. A curious plan is said to be adopted in Cambridgeshire: all the geese are shut up in a shed, and a small dog is put in. The geese, it is stated, will lift their heads up, and go to the back of the shed, while the ganders will lower and stretch out their necks, hissing all the time.

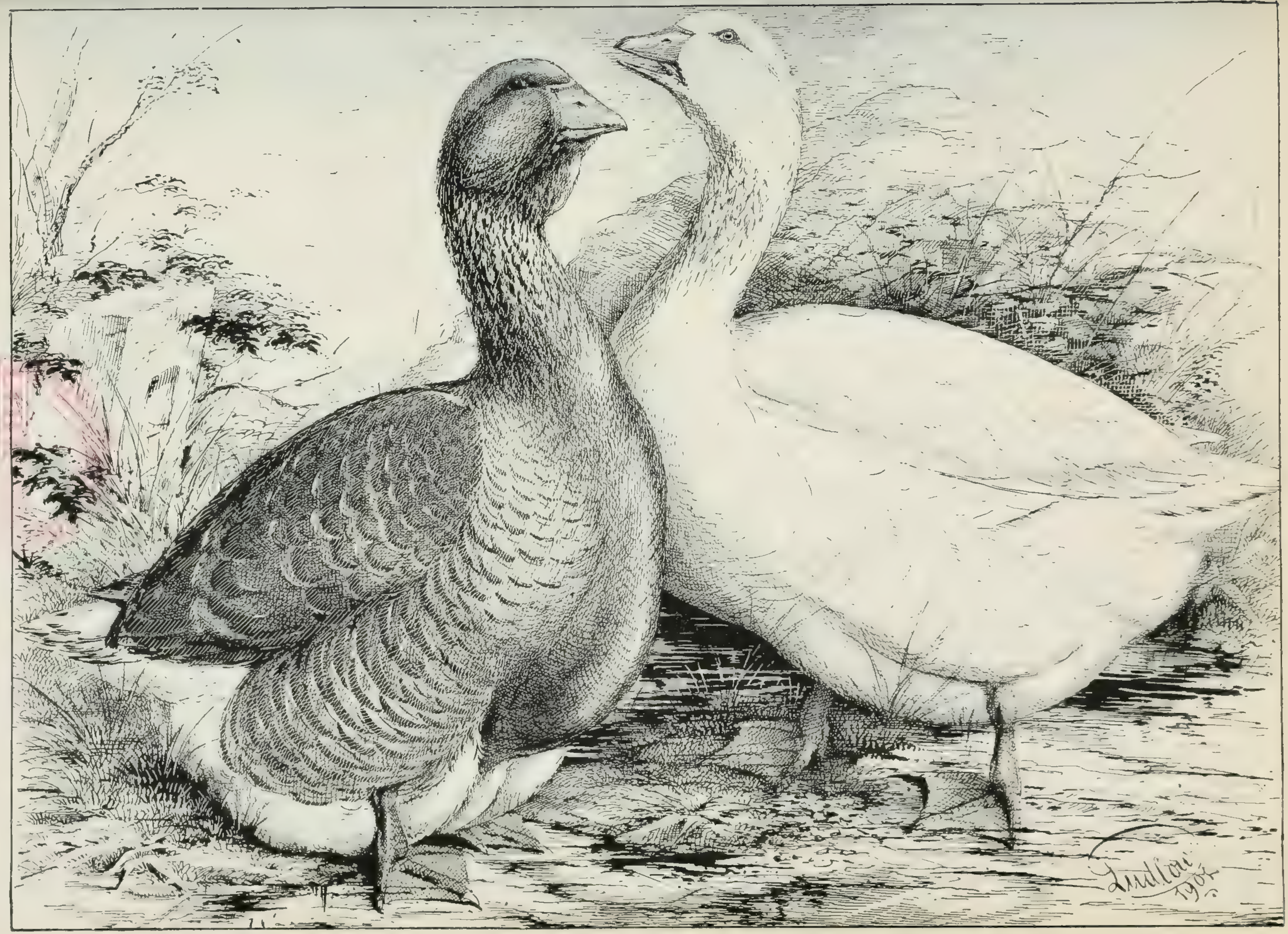
"Embdens are of a quiet, tractable disposition. As layers, they are not considered so good as the Toulouse, an ordinary farm bird laying about twenty to twenty-four eggs in a season, the larger show birds about sixteen to eighteen. Embden geese lay two sets of eggs in the season. They lay in February and leave off in April. The egg is larger than that of a Toulouse, or of an ordinary goose, with a hard white shell. Young geese, as a rule, begin to lay in their first February, but it is not advisable to set the eggs of young birds. A prize-bred goose will lay eight to nine eggs before she wants to sit, ordinary ones perhaps more. It is, however, better not to let her sit the first time, as she may fail to have a second brood if allowed to do so. Her eggs should be put under hens. A hen can cover from three to six eggs according to size. Eggs should be gathered each day the geese lay, and be set as fresh as possible. A goose broken off the first time she wants to sit will, after fourteen to sixteen days, begin laying again, and when she has laid her second complement of eggs, can be allowed to sit, as convenience admits. She generally sits on about ten up to fifteen eggs.

"The eggs take twenty-eight to thirty days to hatch. They are very hard and tough, and sprinkling them with water, especially if laid in boxes, is a good precaution to assist the hatching. In all rearing, however, individuals must be guided by their experience. One breeder of Embdens, when he lets a goose sit, as a rule leaves her entirely alone, to make her nest where she likes, and allows her to hatch off her own brood. Under this arrangement, a prize goose appeared on one occasion with twelve splendid goslings. Many approve of this natural treatment. But another breeder has tried this plan of leaving the goose to nature, to find invariably, when hatching, the eggs broken and the goslings squashed, as if she was too heavy to hatch them properly.

"A sitting goose will come off to be fed with the rest of the poultry. She carefully covers her eggs with down, and straw, or whatever is available, before leaving them. She will often choose a place for her nest near a stack yard or where there is litter, giving preference to a situation near a pond, instinct telling her that the result of a good bath helps to moisten the eggs. The other geese will not disturb her on her nest, and the gander always takes a special interest in the sitting goose.

"Embden goslings when hatched are yellow, some, however, with a grey tinge on their down. Observation has proved that the grey ones are geese, and the bright yellow ones invariably ganders. It is said that Pfannenschmidt, who was a well-known merchant and connoisseur of geese at Embden, also certifies this; but this theory is not accepted by all.

"Embdens can be brought up like ordinary geese, and are hardy; but prize birds, like all highly-bred exhibition stock, are more difficult to rear than the ordinary ones. For goslings at twenty-four hours old, little rolls of dough, sometimes mixed with raw or boiled eggs, put down their throats, form the most suitable food. At about two or three days old they will be able to eat meal, or whole corn, which is better when soaked. As with all goslings, care must be taken to avoid damp, or very hot sun, where they cannot get shade. Where there are ten or twelve goslings together, they can be left without a hen at a week old, but where there are only two or three, the hen should have charge of them for two or three weeks. They can be allowed as a rule to sleep out at a month old.



TOULOUSE. EMBDEN.

GEESE.

March-hatched goslings are generally found to be the strongest.

"Grown-up birds hardly ever ail anything, but if they do become ill they rarely recover. They are sometimes seen to 'droop,' their feathers looking draggled and damp. This state of health is caused by cold clay soil, and a change at once on to dry gravel soil, as a rule, sets them right again. There is probably a want of oily secretions to supply the feathers. By some this appearance is said to be caused by an irritating insect on the birds. Diluted paraffin is said to be a cure. The defect of a twisted or hanging wing in Embdens can sometimes be remedied by tying the wing into the right position. Owing to their white plumage, though not absolutely a necessity to Embden geese, a pond is an advantage; and essential with show birds. Embdens can sleep out at night (where there is no fear of foxes) even in the severest weather.

"The prize points of an Embden gander and goose are the same. Any signs of a Toulouse cross, such as a throat-gullet, breast-keel, or looseness of feather, must be avoided. Judges agree that these defects ought not to be allowed. The contrast of the two breeds with regard to type has been described as that shown between a typical hunter and a Shire cart-horse. It is a question whether the cross with the Toulouse gave size to the Embden, or only semblance of size from loose feathering. The compact feathering of the true Embden often deceives the eye as to actual size and weight. The judges discourage Toulouse points in the Embden, in order that Embdens may stand on their own merits, and thus develop their own good qualities.

"At about two years old Embden geese and ganders attain their full weight, and do not as a rule increase very much after that. The standard gives weights up to 34 lbs. for a gander and 22 lbs. for a goose, and the weight of prize birds should be from 24 to 34 lbs. for ganders, and 20 to 26 lbs. for geese. The weight of a fine Embden, in proportion to its size, is sometimes deceiving. A few weights which were taken of young birds may roughly serve as average specimens. A goose eight weeks old weighing 15½ lbs., by Christmas would be 22 lbs. A gander at eleven weeks 16½ lbs., would be by Christmas 24 lbs. or more. A gander at sixteen weeks weighing 20 lbs., would probably scale more than 24 lbs. by Christmas. Twenty is a good average weight for birds hatched in April to attain at Christmas. The following weights, given by two fanciers, may be quoted as examples of fine birds. A gander (in store condition) 26½ lbs. A pair, exhibited, 55 lbs The weights however, are very variable. A good deal of the weight, of course, depends on 'feeding,' and extra food will soon add a pound or two. Birds also lose weight quickly, even in going to and from a show. Prize geese should always be well fed, and very little extra food will then bring them into condition for exhibition.

"Shows under the Waterfowl Club rules require geese to have a ring on one leg, to show the year of hatching. They should be put on at about three weeks old, as soon as the gosling's feet are large enough to prevent their falling off, for if forgotten at the right age, it is impossible to put them on afterwards. The plumage of Embdens should be spotless white throughout, and condition requires hard feathering. The description of an unsophisticated visitor at a Royal Agricultural show, when looking at a champion Embden gander, was singularly appropriate: 'He looks as if he was carved out of marble.' The bill is longer than that of the Toulouse. It should be bright orange, the nut at the end being paler, and the nostrils and softer parts of the bill shading into red. This colour becomes brighter in the spring. The feet and legs should be bright orange. The eye is blue, with an orange rim. The blue eye is probably a form of albinism, and the brighter the blue, the stronger indication of the genuineness of the white breed. In breeds of geese that vary between the white and grey, the blueness of the eye is variable. Preserving, therefore, the point of blue eyes is a means of helping to ensure the reliability and pure whiteness of the race. The twisted or curled neck feathers, which are also seen in the Toulouse and other European geese, is a characteristic of their ancestor the Grey-lag.

"Geese should have a good swim in a clean pond the day before they are to be sent off to a show, and should then be shut up for the night on clean straw. They should not be frightened when caught, and be handled gently by whoever is accustomed to look after them. The way to hold a goose is to take the neck in one hand, the bird's back towards you, putting the other arm right round the goose, keeping the wings quite firmly down. The bird should be put head foremost into the basket, so if the feathers are touched they are rubbed the right way. The best basket is a round wicker one, covered with canvas, about 30 inches high and 30 inches diameter. The only drawback to exhibiting geese is their weight for carriage.

"The best proof of the value of this breed in the United Kingdom is the great increase in the numbers kept. In Norfolk about twenty years ago there was only one breeder of pure Embdens, and now there are over a score, besides numbers of rearers who buy Embdens for crossing purposes. Thirty years ago exhibition Embdens were in the hands of a few fanciers, the most famous coming from Lancashire. The exhibitors of this variety are now more widely distributed. Not only in this country are these fine birds sought after, but goose breeders from all parts of the world are eager to obtain them. Both sittings of eggs, and birds, are exported far and near. Possessors of Embdens may well be proud of their geese. It is an interesting study to preserve their swan-like whiteness, to increase their size, to maintain their special capacity for early growth and delicate quality of flesh for table, and to improve their laying qualities, always endeavouring to keep the stock hardy and healthy. With care and practical work, these objects can easily be attained. The breeder of a typical Embden may indeed feel that he is the happy possessor of the goose that lays the golden eggs, and will be able to say that 'all his geese are swans.'"*

The Toulouse Goose.

The Toulouse breed takes its name from the well-known city in southern France, round which birds generally similar to, though not so fine as the English stock, are still reared to a large extent; and it is this variety which is used in the production of the celebrated *pâté de foie gras*, so much imported from the Continent, the essential part of which consists of goose-livers potted with truffles. Did people realise how this delicacy is produced, it is to be hoped that it would be less popular than it is, even amongst fashionable epicures. To make a painful story as short as possible, even by the more merciful feeders the geese are confined in a very hot room or caged near a stove, and there forced with fattening food until they would die in a day or two more, when they are killed, and their livers are found swelled to an enormous size; but there is unfortunately no room for doubt that by some the wretched birds are tied down to prevent their moving, and by a few, actually nailed by their feet to a board.

This goose is beyond doubt the result of breeding and feeding up the grey or dark descendants of the Grey-lag, and presents marked differences from the preceding in several respects. For the following descriptive notes we are indebted to Miss Campain, of Deeping St. Nicholas, Spalding, known as a prize-taker with this variety for many years:—

"It is many years since I started breeding geese, and for several years I have been an exhibitor at the leading shows of both the Embden and Toulouse, with a fair share of success, but I treat here of the Toulouse variety. I started by buying a pair of his celebrated geese from Mr. Fowler, of Aylesbury, who had then quite as good birds as anyone, if not the best at that time. The gander, I think, was without exception the longest bird in every way I have seen, and the goose was remarkably good in colour, very wide and deep, and not showing the least tinge of brown in plumage, but of a beautiful silver grey.

"This variety should be massive and heavy in appearance in every way. In both the gander and the goose the head should be broad and deep in face, the beak being in a straight line from the top of the head to the tip, very strong and without any indenture or hollow in the top bill, which gives the bill a most objectionable snipy appearance. The bill should be of a rather brown flesh-colour,* the dewlap should hang well down, and be as large as possible. The neck should be long and graceful; a short neck completely spoils the appearance, and in mating up for breeding, care should be taken in this point, because they are apt to breed short. Both for the show-pen and for breeding, the birds should be exceptionally well bowed in front and 'keeled' deeply, points which in this variety are of almost primary importance, with their bodies almost touching the ground behind. They must be very broad across the back, and long to the tip of the tail. Their legs must show as large an amount of bone as possible, to get which is a great indication of size and massiveness. In colour they should be rather dark grey on the head, neck, back, and wings; rather lighter on the breast, gradually becoming lighter towards the belly, where it ends in good pure white. The plumage should be as free as possible from a brown tinge, which I strongly object to, though it is prominent in some strains. The sun has some influence on this, but very little comparatively on good-coloured ones compared with others. The legs are a deep orange colour.

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* In compiling this article most of the standard English works on poultry have been consulted, also the following authors: Blanchon ("Canards, Oies"), Dürigen ("Geflügelzucht"), Kramer ("Rasse geflügelzucht"), Vienkoff ("Les Oies en Russie"). The Journals of the Royal Agricultural Society, and Société d'Acclimatation de France; the *American Poultry Journal*, and *Live Stock Journal*. Notes on the rearing and exhibition of Embdens have been most kindly given by many breeders and judges, including Messrs. Abbot, Baily, Bagshaw, Bragg, J. Pettipher, MM. Flescher and Marchand (Muids, France), Herr Radetzky (Würzburg). Information has also been received through the kindness and courtesy of Mr. Brown (Secretary, National Poultry Organisation Society), M. L'Hoëst (Société Royale de Zoologie, Antwerp), M. Loyer (Secretary, Société Nationale d'Acclimatation de France), M. Oustalet (Mus. Hist. Nat., Paris), Mr. Theobald (British Museum, Natural History), M. Van der Snickt (Brussels), Captain Boyle (British Consul, Copenhagen), Mr. Boyes (British Vice-Consul, Bremen), Mr. Zorn (British Vice-Consul, Emden).

* [*The standard says "orange." See also next page.*—ED.]

"I consider the birds of this variety are more commanding-looking, if I may use the term, and more graceful, than they were when I first started breeding and exhibiting them. The Toulouse are more prolific than the Embdens, as I have frequently known them to lay forty or fifty eggs before leaving off, and seldom ever showing any tendency or wish to sit.

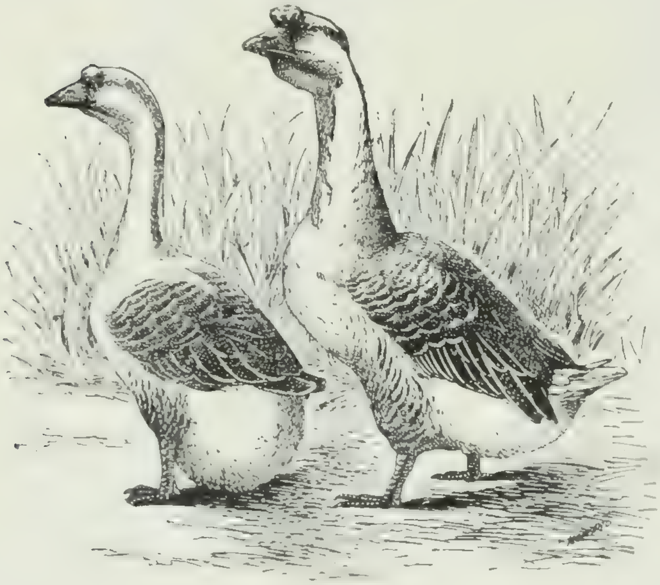
"Formerly in this district the goose industry was a very large one. It was no uncommon occurrence to meet a thousand geese on the road six or eight weeks before Christmas, going to the various dealers or breeders to be fattened up, and which in due time were dressed and forwarded to market, or to various clubs. The breeders would send to the various farmers the stock birds, two or three geese and one gander; then about Michaelmas divide the produce with the farmer, giving him half he had reared, or allowing him half (about 2s. 6d.) upon the whole, or else 5s. each for his half share. It was nothing unusual to see as many as ten thousand geese on one place, collected from the farmers prior to selling them to the feeders to fatten up, and I have heard of half a dozen of such feeders, in this neighbourhood, also sending as much as £50 worth of feathers and down to Boston in a cart at one time. I am sorry to say that there is nothing of the sort now; I do not know a single person carrying on this business near here. The large foreign importation of both turkeys and geese has almost completely killed the industry, or rather the profitable part of it, but I am rather inclined to think that turkeys are also taking the place of geese to a certain extent."

The Toulouse goose is generally stated to surpass the Embden in weight, but this idea is by no means borne out by historical records, and appears mainly founded upon the reputation of certain celebrated birds, an element of crossing having also something to do with it. In regard to the last point, it has been already mentioned above that the Embden is in some degree indebted to the Toulouse; and it is equally beyond doubt that many Toulouse geese have been crossed with the Embden, the motive in both cases having been the fact that a cross between any ordinary stocks of the two, usually produces goslings heavier than either of the parent races. But the size of these cross-bred birds is not kept up if breeding is continued with them; and a further result has been the obliteration of proper distinctive marks in many prize pens. Breeders of pure Embdens and Toulouse have during many years often complained to us that they have been unfairly beaten by specimens obviously cross-bred; and we have frequently seen so-called Embdens with dewlap and keel, while, conversely, Toulouse geese have been shown with clean gullets, and too high on the leg for pure Toulouse. In the absence of such obvious signs of crossing, there can be little doubt that even the "orange" bill described in the Standard, where it exists, is more or less due to an infusion of Embden blood; for not only is the bill described above by Miss Campain as brownish flesh colour, but in 1872 the late Mr. J. K. Fowler himself described it to us as resembling "sunburnt flesh," which is practically the same thing, and is beyond dispute the colour of the bill in the original pure breed. Another frequent sign of crossing is found in white feathers round the base of the bill, which in some cases is even accompanied by a light eye. Returning to the question of weights, however, there are some who still remember when the late Mr. J. K. Fowler and Mrs. Seamons were the principal champions of the day in the goose classes. It is within our own personal knowledge that Mr. Fowler's heaviest Toulouse gander weighed once 38 lbs., while the heaviest Mrs. Seamons ever had was 36 lbs. Probably those weights have never been equalled by any white goose, though we had strong reason to suspect some white blood in both. In 1870 the heaviest Grey pair at Birmingham weighed 62¼ lbs., probably never equalled by any other pair; and in 1871 they were 60 lbs. But in 1874 the heaviest Greys were 58¼ lbs., while the heaviest Whites were 59⅛ lbs. After that, extreme fattening for weight began (happily) to go out of fashion. In 1875 the heaviest Birmingham Greys were 51 lbs. 9 ozs., against 58 lbs. 9 ozs. for Whites; and since that time the weights have often been still less, and Whites quite as often as not the heavier of the two breeds.

The Toulouse usually looks larger than the Embden, owing to its much looser feathers; and its heavy keel gives a far more massive and heavy appearance. Owing to this different conformation, two geese to one gander generally do better than three in this variety. As it does not sit, or at least not with any steadiness, the eggs must be hatched otherwise; and, owing to the greater number laid, a larger flock can be reared from one pen of Greys than from one of Embdens. The ordinary saddle-backed geese of farm-yards are generally descended from half-bred stock, and some of them are very fine.

The Chinese or African Goose.

The Chinese or African goose *(Anser cygnoides)* has also been termed the Hong Kong goose and Knobbed goose, and some birds have been written of as Spanish geese, which appear to have had the same general characteristics. It was classed by Cuvier actually with the swans, which it resembles in the longer and more slender neck, and the knobbed bill, also in the neck feathers being smooth and not curled as in the two preceding varieties; and it has been recorded on two or three occasions (on rather doubtful authority, but the gander is such an ardent breeder that it is not unlikely) to have produced swan hybrids. But that it is a true goose is proved by not only its domestic habits and prolificacy, and the number of its vertebræ (sixteen), but by the fact that it breeds freely with other geese, and that the produce is fertile and not a hybrid; the common goose of India being, as Mr. Blyth pointed out long ago, a cross between the Chinese and the ordinary domestic race known to us. This immemorial crossing, in India and elsewhere, is the explanation of differences that seem to have puzzled some writers in America, between the "African" goose as there known, and their smaller Chinese.



African Geese.

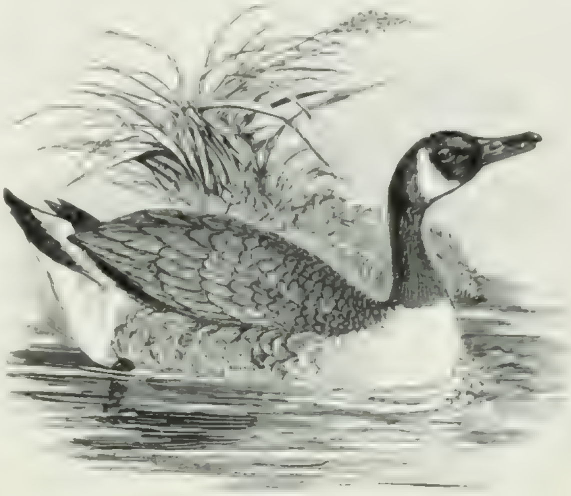
The original Chinese variety ranges over all China, much of Siberia, and most of India, but chiefly northern India. In size it is midway between the wild goose and the swan, but considerably less than our large domestic geese. The neck is long and slender, but the head rather large for the bird, with a knob or protuberance much like that of a swan at the base of the upper bill, and a heavy dewlap under the throat The usual colour is brownish grey on back and upper parts, passing into light grey or almost white underneath, the breast and front of neck a yellowish grey, and a dark brown stripe running all down the back of the neck: in this colour the knob is generally black, the bill orange or dark brown, or even black, the legs orange. There are also white birds, which have orange knob and bill; in these also there is a stripe behind the neck which, although white, is more glossy, and different in appearance from the other plumage.

This Chinese race is very prolific, laying twenty to thirty eggs in a sitting, and several sittings in a year, the eggs being about two-thirds the size of those laid by fine ordinary geese. The breed is very hardy and easily reared, and the flesh of very delicate quality; but it is not so domestic in habits as the European geese, and rather fond of swimming at night. It has a harsh and peculiar cry, the most shrill amongst any of the true geese known in domestication.

The "African" goose, as known in America, is stated by American writers to have come from either India or Africa, and is considered by most of them to be a distinct "pure" variety. It is very much larger than that just described, adults weighing as much as 24 lbs. for ganders, and 19 lbs. for geese, and being described by Mr. Cushman and others as actually the largest of all the geese. It is standardised at the same weights as the Embden and Toulouse; but the standard American weights for these are only 20 lbs. and 18 lbs. for the two sexes, which is far less than in England. All the known facts and circumstances point to the conclusion that this African goose of America is originally simply a cross of the Chinese with the domestic goose, and especially with the Toulouse. During the last thirty years Africa has been opened up in all directions—north, south, east, and west—as it never was before, but no wild goose resembling this breed has ever been found. It probably did come from India, where such crosses have existed for generations; and it is even quite likely that some of these Indian birds may have been carried to East and South Africa by the coolies and Banian traders who have visited those districts so largely; but every single point about the bird tells unmistakably of such a mixed origin. The breed has more of the solid carriage of the Toulouse; the brown has become more grey; the knob is less prominent in proportion; the neck is shorter and thicker; and—most significant of all—the eggs have become fewer, and often as large as those of the older domesticated varieties. The voice also is deeper and more approaching that of the domestic goose, and the flesh more of the same character as in that breed. In the only American specimens of "African" geese which we have seen, a strong element of the ordinary domestic goose was quite unmistakable. It is not necessary to suppose any recent cross-breeding, as some of the Indian birds may quite possibly have possessed all the present features of the African; but it is significant that energetic crossing with the European breeds is now openly practised and strongly recommended by American writers, and it is probable that it has taken place on many occasions. The illustration herewith was given in an American poultry journal as one of the "Chinese" goose, and originally procured for this work as such; but on finally tracing it back, with considerable trouble, to its origin, we found that it really represents a photograph of the "African," in which character it is reproduced here.

This fact illustrates the direct connection between the Chinese and African goose; but it cannot be questioned that in the American modified race, however produced, we have the most valuable and useful form of the breed. Even the African, however, varies considerably. While Mr. Cushman places it first in size, and states that it lays the largest eggs of any, but does not put the number higher than in the Embden, if as high, Mr. Rankin does not put size so strongly, but states that his birds are better layers than ever, and reach about sixty eggs per annum. These differences are largely accounted for by the fact that recent American breeders have chiefly crossed the African goose, when crossed at all, with the Embden, in order to get as many white goslings as possible.

The great merit of this characteristic race, however, is as a *breeder*. Every goose breeder knows that the ordinary goose is slow to mate, and requires time, as presently mentioned. Both Chinese and African ganders mate earlier and more quickly, and at a pinch will mate successfully with one or two more geese, being ardent in disposition. The curious fact is also noticed that even an Embden gander will be prolific earlier, and mate with more African geese than with his own variety. As the cross makes weight early, and is of good quality, these facts are of value. There is of course nothing remarkable, to English notions, in ganders of 20 to 24 lbs.; but as these are fully equal to the American weights for other breeds, the real aspect of the matter is the existence of a breed equal to Embdens and Toulouse in size, with the advantages just stated; and from this point of view the African, as developed in America, appears well worthy of attention from English goose-breeders who desire an early market. As before intimated, the cross-bred produce are not hybrids, but simply crosses, and perfectly fertile.



The Canada Goose.

The Canada Goose.

The only other breed requiring particular mention is the Canada goose, the ordinary wild goose of Canada and the United States, but which has a much wider distribution. It has often been shot on the wing in England, where quite wild flocks of it have been seen; and it ranges through most of the Arctic regions, at least as far north as Spitzbergen. This goose used to form an important portion of the food of the Hudson's Bay Company's trappers, one goose being reckoned as a day's ration, and recorded in the Company's annals as averaging about 9 lbs. The size and weight are thus equal to those of the wild Grey-lag, though in comparison with domestic geese it must be called a rather small breed. The somewhat long body, the long and slender neck, and the character and shape of the head, much resemble those of the swans. Buffon states, indeed, that at Versailles in his time the domesticated Canada geese had bred, or hybridised with the swans kept there, and the older naturalists gave this goose the generic name of *Cygnopsis Canadensis*; but its affinities are clearly with the geese rather than with swans, and it will breed with the races previously described, though the progeny is perfectly sterile.

The head, bill, and greater part of the neck of this goose are black, with a conspicuous white cravat rather than collar at the throat, the head and bill being long. The feathers of the upper parts of the body are greyish-brown, rather lighter at the edges, shading into ashy grey at the wing-coverts, and gradually shading into greyish-white on breast and under-parts, to pure white on the abdomen. The flanks are pale grey tipped with white, the quills of the wings, and tail, almost black. The legs are rather long, set somewhat back so as to give a commanding carriage, and in colour blackish-grey to black. The amount of brown differs somewhat, some birds being an almost pure black and grey.

Small flocks of these geese are often kept in a half-wild condition as ornamental water fowl, on meres and lakes; and such flocks do not much exceed the weight above given. But by selection in the United States, where they are very largely bred in domestication, the size has been increased, until they have adult ganders weighing 16 lbs. and females of 14 lbs. The goose is not a good layer, more than nine or ten eggs being seldom produced in one laying, though a second is often obtained by taking the eggs away. It is cultivated there for the table qualities, either of its own goslings, or of its hybrid produce, which is almost always bred with the African goose. The flesh of the Canada goose is considered more delicate and delicious than that of any other known waterfowl except one, the far-famed Canvass-back duck; and the hybrids have almost the same reputation for quality, and realise the highest prices of any geese marketed in America. Now that the somewhat gross and rich quality of the ordinary goose appears to have lost much of its former favour in England, this delicacy and quality of flesh of the Canada and its hybrids are of special importance, and may open out some fresh possibilities.

The cross-bred birds are known and sold in American markets as "wild mongrels," and the largest Canadian ganders are specially valued for breeding them, realising from ten to twenty-five dollars. This kind of breeding is only successfully carried on by experienced men, who understand both the Canadian and African breeds, The Canada gander only mates with a single female, and is not very ready to mate with another variety; he has therefore to be run with the goose for some time, and should have a good range, with ample water, as natural-looking as possible; on the other hand, when once mated he will breed for many years, forming very strong attachment to his partner.' The African gander is also sometimes used. He may be mated with several Canadian females, and will breed more readily, but the Canadian females lay few eggs, and those not very early in the season.

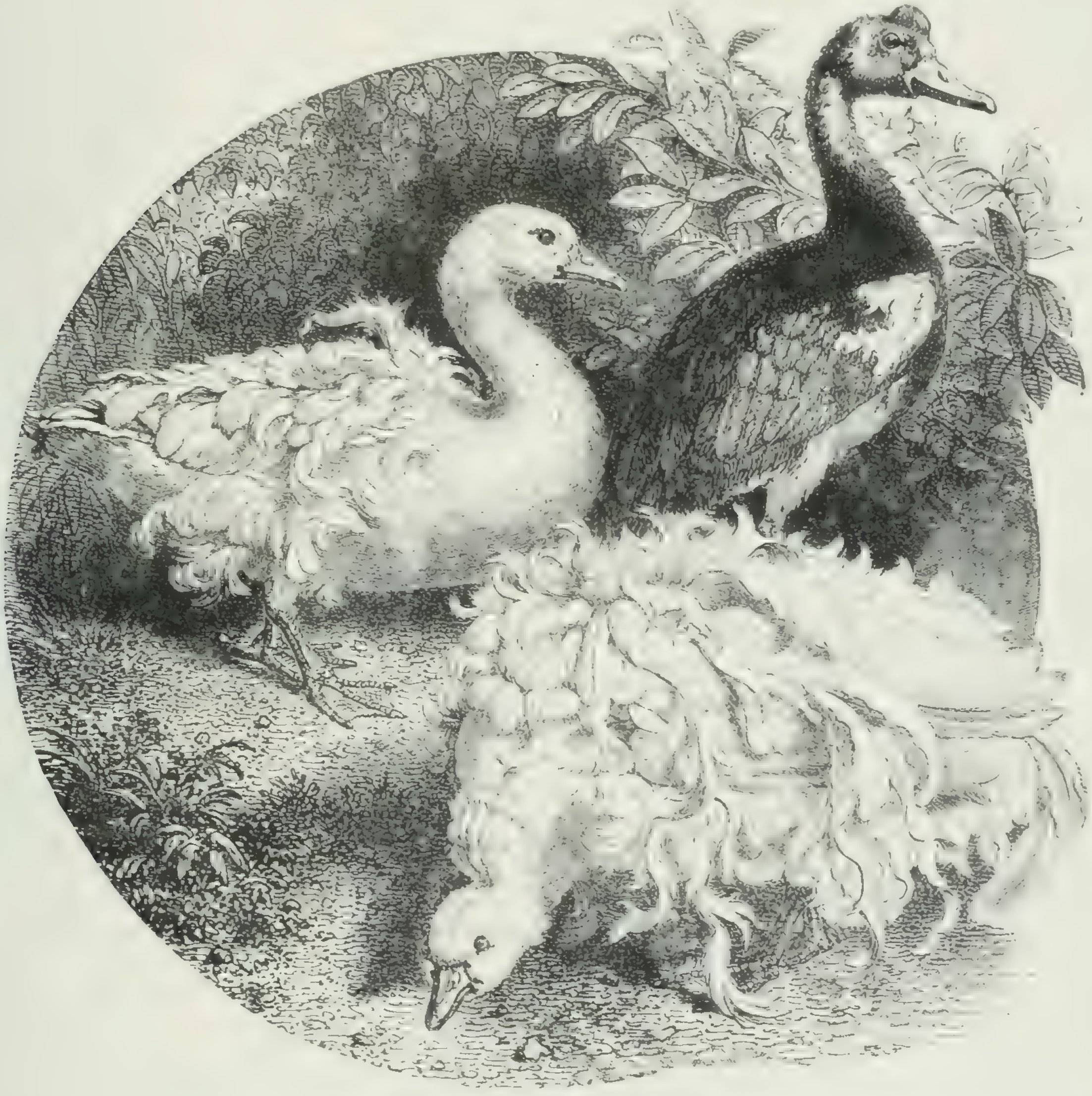
Minor Varieties and Ornamental Geese.

One or two sub-varieties of the domestic goose only require brief mention. The best known is the Sebastopol or Danubian goose, which has plumage of pure white but of a peculiar character, somewhat between that of the Frizzled and the Silky fowl. The feathers, except those of the neck and breast, are very long, and slender in the quill, and curled, so that the wind blows them all about. The head, bill, and body are rather long. These birds are small, only averaging about 10 lbs. each, and are also poor layers, and by no means equal to the ordinary races in quality of flesh. They are the most quiet and tame in manners of all the geese, but are only valued by some for their quaint appearance, and are of no practical interest.

A variety was highly recommended by several writers about ten years ago under the name of Italian geese. It has been stated to be unusually prolific, laying 50 to 60 eggs in one laying, and sometimes a second. Mr. Tegetmeier describes them as mainly white, with a blue-grey head, a grey roundish spot or patch between the shoulders, and grey thighs. But a great many we have heard of have certainly not come up to that standard, and have been decidedly small. Mr. R. Fowler found them, on trial, to possess no superior merits, and they have been scarcely heard of during recent years.

Mr. Edward Brown published in 1899 an interesting account of two varieties of geese which he had found in Russia, known as the Arsamas and the Tula breeds, both bred in the country south of Moscow, and for the special purpose of *fighting!* The Arsamas is described as pure white, and weighing from 15 to 20 lbs., while the Tula is grey, and from 12 to 15 lbs. In both the head is very short, almost round, with a wide forehead bearing two prominences in old birds; the bill also very short and thick at the base, coming down in almost an unbroken line from the forehead. The wing-muscles are enormously developed, causing solid flesh on the breast, rather than depth of abdomen. It is claimed that crossing this breed upon other European geese has somewhat of the same result as crossing English fighting Game fowls upon large-bodied birds. The flesh of geese is so very different from that of fowls, that this appears exceedingly questionable, and still more so that the cross is likely to be of any service to breeders of the recognised varieties.

The so-called Egyptian goose has been already referred to as in reality a large Shieldrake. Of several other "geese" often kept upon ornamental waters, the Cereopsis goose of Australia, and the Magellan goose, can also be scarcely regarded as true geese. Of the latter, a South American bird, there is a variety called the Chilian: both stand high on the leg, are prettily barred in the plumage, and graceful in shape, and can be kept with little water if their run is good. The Magellan is fairly good tempered, but the Cereopsis gander is sometimes dangerous. The Bar-headed goose comes from India, is also of slight and graceful build, and marked by three black bands at the back of its white head. The Gambian goose has a knob on the top of the head something like, but farther back than that of a swan, and a powerful bony spur at the wrist-joint of the wing; it has long legs and stands very upright, the plumage being chiefly white and black, the bill and legs dark red. It is shy, but has been known to breed in suitable circumstances. Several of the birds here mentioned have been on rare occasions exhibited, but are really only suitable for the


Sebastopol and Gambian Geese.

lake or private enclosure, and are of no economical importance. In breeding them, they must have as much as possible of secluded shelter, and be left pretty much to nature.

Geese for Market.

The industry of goose-raising for the British market has seen great changes, having been at one time a very extensive one, which has considerably declined of late years, as already indicated by Miss Campain. In 1896 a sensational account of an alleged great goose ranche in Essex was published, and copied rather extensively, which contained some extraordinary statements. It was alleged that there were 30,000 birds on the ranche ready for market, with others coming on; that thirty-five men were employed; that the owner cleared between £2,000 and £3,000 a year, and that "many others do the same." It is unnecessary to comment on such statements as these, none of which were correct at any period; still, at one time immense numbers of geese were reared and fattened, especially in Lincolnshire and Norfolk. Besides scouring the country for what goslings were procurable young from the farmers who had bred them, very large supplies of young live birds were imported from Ireland and Holland, the latter consignments coming most largely from Rotterdam. A large dealer near Norwich is stated to have imported from Rotterdam in 1872 very nearly 5,000 young birds for feeding, which mostly came through Hull. Many foreign goslings also came to Liverpool, for the more northerly dealers, Silloth being another northern port of entry. This Irish and Continental trade in live goslings for feeding is still carried on, but to a very much less extent than formerly, for which there are various causes besides an undoubted fall in prices.

One cause often alleged for the falling off of geese reared in England, is the considerable decline in area of unenclosed commons and waste lands. Such land is peculiarly favourable to the goose industry, no doubt, and its diminution cannot but have had effect; but so far as prices are concerned, that effect would be rather to raise them, whereas there is no doubt that they have decreased, in spite of the diminished supply. Thus a decline in price, and also of facilities for cheap rearing, have worked together to make goose-breeding less profitable than formerly. Another cause, though less important, has not received the attention it deserves. The feathers were once more valuable than now, and live geese were often plucked several times a year to supply them. Steel and other pens have nearly destroyed the market for goose quills; and owing to the better knowledge of hygiene, where respectable families once always provided feather beds for good bedrooms, these are now mostly furnished with hard mattresses laid upon spring-wire, and the returns from this source too have greatly diminished. It is doubtful if profit has really been much lessened by this cause, as it is now known that the strain of being plucked sapped both the vigour, and laying, and fertility of the stock; but the apparent inducements were decreased, and this has had its effect, as no doubt has the increase in cheaper foreign supplies.

The chief cause of all, however, is undoubtedly that popular taste has changed. Roast fat goose is a somewhat rich and gross dish, and all the reports we have received from market salesmen go to show that the demand for Christmas poultry especially, has gradually been more and more transferred to the more delicate turkey. The goose has gradually become more a working-man's dish, and the demand from even that quarter has been checked considerably by recent interference with licensed houses, many of which were once centres of enormous Christmas goose-clubs, so that some of them would order as many as a thousand birds, which were desired large and plump. From some or all of these causes the demand for large fatted geese has greatly decreased in the principal markets; while it is remarkable that it keeps up best, and has in a few localities even increased, in the thickly-populated industrial districts of the Midlands and north of England.

If goose-breeding and feeding is to be carried on profitably in England, it must recognise these modern conditions and this change in taste. There will always be some market for large fat birds at Christmas; but it is more limited than formerly, and the best quality will have the preference. This depends upon even feeding for flesh rather than fat; and as lean goslings fed up rapidly with fattening food do not supply this, masses of fat on a goose will not "sell" nowadays. Experience proves that feeding mainly upon oats or other grain, given in water, largely avoids this deposition of useless fat. But the revival of any considerable goose-industry, apart from the northern demand alluded to above, seems likely in future to depend largely upon *earlier* birds, of *smaller size*, but of first-rate *quality*. It is probably this development which has lately given greater predominance to the pure Embden breed, which matures early, plucks to a nice colour, tends rather to solid flesh than fat, and is decidedly less "rich" than the Toulouse. Still more worthy of attention appear to be those hybrids or "wild mongrels" between Canada and African geese, which top the American market, and are affirmed to be equal in flavour and quality to the Canvass-back duck. It is by no means certain that British consumers can be educated to a similar taste; but it is possible, perhaps probable, that earlier birds of smaller size and such surpassing quality might find more room, and create a demand, as they have done across the Atlantic. The earliest would cost very little to feed, being killed as "green" geese; and up to Michaelmas the stubbles would afford nearly all that was required.

Now that the margin is narrower, causes of unprofitableness in the breeding stock must also be avoided. Totally unlike fowls in this respect, geese require *time* to get acquainted and to mate, and fresh stock is very often put together too late, with the consequence that eggs fail to hatch. They will not breed together, as a rule (we speak of the ordinary breeds), until they have been acquainted for some time, and often not at all the first season, unless put together early. Two-year-old birds are the strongest, and these should be put together not later than the beginning of November, if possible. It is really better in general to buy young stock, and indeed good adult stock is often very difficult to procure; but young birds should be bought chiefly in anticipation of what they will produce the following season and afterwards. From this point of view the amorous disposition and generally much quicker mating of the African goose may offer the goose-breeder solid advantages. The progeny of this bird with Embden is mainly white, and the flesh is considered in America less gross, or more delicate, than the old-fashioned Embden and Toulouse cross.

Geese are generally killed by piercing the brain from the back of the skull. A spot will be found there just where head and neck join, at which there is no protecting bone—there the knife is inserted, and also severs a principal artery. Many killers first stun the bird by a sharp blow on the back of the head, which obviates pain and struggling, provided it be done with sure hand and eye. Some feeders stick them in the roof of the mouth, after stunning them as above. They are usually plucked before bleeding has ceased.

The best geese of France are largely fed upon whole buckwheat, given in troughs of water. This produces white flesh, with scarcely any fat, while the same grain, ground into meal, is said to produce too much fat. This confirms the results in England from feeding upon white oats in water. The best of these French geese are sent to Paris, where they realise as much as 1½ francs per pound, and only inferior produce is sent over for the cheaper markets in England.

The largest consumers of geese upon the Continent are the Germans, whose taste is exactly suited by the rich flesh of this bird. Enormous numbers are reared at home, every farmer keeping more or less; but, in addition, immense quantities are imported from Russia. An interesting report from the British Consul-General at Berlin, in 1901, states that a special "goose-train" of from fifteen to forty cars arrives in that city daily from the Russian frontier, fitted specially for, and occupied solely with, this traffic. The latest figures procurable show that in 1909 these imported Russian live geese numbered 6,681,723, and were of the value of £1,135,900. These figures indicate that 895,361 more Russian geese were imported into Germany in 1909 than in 1899, and that the increase in value was 7¼d. a bird, or 21.65 per cent.

The industry of goose-fattening on a wholesale scale has only developed in the United States quite recently, Mr. E. A. Cornell, of Rhode Island, being the principal pioneer. He has lately been in the habit of fattening from 12,000 to 15,000 annually, breeding none, but collecting them from the farmers round, none of whom rear more than a moderate number. He has laid down plant costing about 15,000 dollars, and up to last accounts had been in the habit of penning about 300 together in one pen. The birds, when ready, were sent to New York, where they fetched the top price as "Rhode Island geese," and considerably more than the breeders themselves could realise by their old methods. Similar business has been carried on by several smaller men. But during the last few years the system has been put in jeopardy by the outbreak of a disease known as goose cholera, which runs its course so rapidly, that birds affected almost always die within 36 hours of experimental infection, and often within less than an hour of the first apparent symptoms. The chief of these are staggering gait and agonised motions of the head, in the dirt and otherwise, that appear to denote spasm of the glottis; the passages being found full of mucus and the blood-vessels much congested. The liver is studded thickly with yellow nodules. Mr. Cornell, in 1900, lost thousands from this disease. A bacillus was found, and pieces of the viscera of dead birds fed to healthy geese caused death in less than 30 hours. The success of Dr. Klein with contagious fowl enteritis (see next chapter) gave room to hope that a protective anti-toxin might be prepared from pure culture of the bacillus, but this had not been done up to the last advices we have received.

We mention this because of its importance in connection with such methods of fattening. The system has been profitable to the smaller breeders of Rhode Island, who sell their goslings to the feeders; but such losses must put an end to it in that form unless a sure remedy be found. All British experience goes to show that geese do best either at large on stubbles or roots, or else in small quiet yards, without too much light or exposure, and do not thrive well in very large pens of several hundreds. We have already alluded to the desirability of only penning together the number which can probably be killed and marketed together; a consideration which tends in the same direction, and moreover enables more systematic care to be given to bedding and cleanliness. To shortcoming in these respects such outbreaks may probably be due, and it is likely that restriction of the number in one pen to fifty or less, may prove more of a cure than any direct measures.

We have never heard of any similar outbreak in England; but amongst those reared for exhibition a very peculiar affection of the floor of the mouth is sometimes found, called by some breeders "dropped tongue" or "fallen tongue." We take the description of it from a note by Mr. D. Bragg, in an article contributed by Mr. Edward Brown to the *Journal of the Royal Agricultural Society*, 1899. The skin is or becomes so lax under the lower mandible, that the tongue sinks down into the hollow, and the bird is, consequently, unable to swallow. The remedy is simple, resembling that for enlarged crop described in the next chapter. The outer skin below the mandible is pinched up and pulled down, separately from the floor of the mouth, and a strip about an inch wide entirely cut out. The edges are then sewn together, taking up the slack, and the difficulty is at an end. While this deformity is less prevalent in Embden geese, the Toulouse, which have heaviest dewlaps, are also said to be less subject to it than smaller gulleted birds. We believe that the real origin of the malformation lies in the mixture of blood already referred to, and to a sort of consequent struggle for mastery between the two types of throat; but as it is practically confined to exhibition specimens, it is no doubt stimulated by forcing diet, or any other cause leading to a relaxed state of the tissues.

SWANS.

The true swans are the largest of water-fowl, though the family, which comprises seven or eight known varieties, has one or two members smaller than an ordinary goose, and possessing characters apparently midway between the geese and the ducks. Their general obvious characteristics are a rather long body carried horizontally, short legs, and very long, slender necks, with long, snake-like heads. The wild birds fly in flocks, in the V-shaped phalanx common to all the larger waterfowl, and when fairly on the wing fly strongly, and sometimes at a height of several thousand feet; but they seem to rise with some difficulty. They usually take flight from the water, and splash along for twenty or thirty yards till they have gathered "way" enough; and they descend in the same way. They are more or less migratory, like the ducks and geese; though often remaining in one locality that suits them. They are strictly monogamous as a rule, though one or two rare cases of two females mating with one male are reported on credible authority; and usually pair for life, which may amount to as much as a hundred years if no accident happens. As usual when such is the case, the two birds cherish the deepest affection for each other, always swimming close together, frequently caressing their mates about the head and neck, and, if necessary, fighting for one another with the greatest courage. They fight with their wings like geese, and strike with fearful force. They feed chiefly on vegetables, including the roots and stems of grasses and plants which they pull up from the mud, stretching deep down with their long necks, but never diving. They will, however, also graze to some extent on land, and it is believed eat also fish-spawn and animalculæ; probably they also eat very small or young fish occasionally.

The male swan is called a "cob," the female a "pen," and the young ones "cygnets." Both parents help to make the nest, which when at large is a very big affair, built up with sticks and rushes and coarse grass outside, and lined with fine grass and down. In this six to nine eggs are laid, which are of course large, and very thick in the shell, of a dirty white or pale green colour. The time of incubation varies somewhat, from 35 to 40 days. The young are densely covered with down, taken to the water by the parents almost immediately, and watched over with the greatest solicitude, more than four or five being rarely hatched out of one nest. The first year the plumage of the ordinary or mute swan is grey, and the bills blackish-grey instead of orange. The flesh of young birds is very tender, and resembling that of the goose, but not quite so rich; and as swans hatched and brought up under geese are much more domestic in their habits, it was at one time thought possible that cygnet-rearing for market might prove remunerative; but the decrease in the demand for very heavy geese has deprived any such attempt of practical interest.

Owing to their slow development, the sex of young birds is not easy to distinguish. When approaching maturity the male of the Common swan is larger and more bold-looking, with a thicker neck, larger knob, and brighter bill. But the first distinction which can generally be observed is that the male swims or floats considerably higher, or more on the surface of the water, while the female sinks much deeper.

The Common or Mute swan is the largest and most graceful on the water of all. It has an orange-red bill with a black knob at the base, brown eye, legs and feet blackish-grey, plumage all over a pure white. Its note is soft and low, but it is not mute, as the name would imply. It is common to Europe and America. A sub-variety called the Polish swan comes from the Baltic region, and is characterised by paler legs and knob, and the fact that the cygnets are never grey, but white from the very first—a singular parallel to the Embden goose. The Whistling, Singing, or Whooper swan (*Cygnus musicus*) really has a most beautiful note, especially when flying in company overhead. It is also white in plumage, but is smaller than the Common swan, has no knob on the bill, and is shorter and thicker in the neck, which is carried more straight and upright. This swan is sometimes found wild in England, and no doubt would be seen oftener but for "sportsmen"; a fine specimen was shot at Avonmouth, near Bristol, in 1901. Bewick's swan is still smaller, and has a similar carriage of the neck. Both these are very difficult to obtain in pairs. The Black swan of Australia was imported many years ago. It is not so large as the Common swan, but the neck has a similar graceful carriage, and the general shape of body is the same. This swan breeds well in confinement, sometimes two broods in a year, and the young are hardy. It has no knob on the bill, which is red, the legs are black, and the plumage black except white in flights. The Chilian or Black-necked swan is about the same size as the last, with a leaden or grey bill, and the large knob on it rich red, the legs orange-red. The body is pure white, the neck and head jet black, all but a streak or patch across the eye. It carries the neck upright and straight. This beautiful bird is not a very ready breeder, but has been reared successfully for many years in the gardens at Regent's Park. Another so-called swan from South America (*Coscoroba*) is smaller than many geese, and has such long legs and short neck that its place in the family is perhaps doubtful. It has red bill and legs, and the body is white except the wing-quills, which are tipped with black.

Swans retain so much of their wild instincts, and are such powerful birds and so jealous of interference, that it is useless to attempt to "manage" them at all like domestic waterfowl. They resent the presence of anyone very near the nest. Where there is ample range of grass and water, they are best left entirely to themselves, like the swans of the River Thames, or as on many meres and lakes in England. On the smaller ornamental lakes of parks and country-seats they must be treated rather differently. Here an enclosed shed should be built at the edge of the water as a swan-house, with one entrance from the water, though there may as well be another from the land. Inside on the bank facility may be provided for a large nest or two, so as to give a little choice of locality, and a supply of sticks and rushes and sweet hay may be placed at hand. Often a nest already half made will be taken advantage of. But for the rest the birds must be left to themselves, beyond throwing them some grain or broken biscuit upon the water. The cygnets may be fed, if wild, in the same way, by throwing Spratt's meal or grits upon the water; but when the old birds have become familiar they will generally bring their young, when once hatched, up to the bank, where first poultry meal, and later on grain, can be given in a trough of water, not forgetting some clean gravel. It seems a rule rarely broken for four cygnets of the Common swan to be reared.

Judging Geese.

The judging of geese has seen many changes during the last forty years. At one time, as already indicated, size and weight were almost everything, especially at Birmingham, and there is not the slightest doubt that the heaviest winners were in some cases *directly* cross-bred; the fact has been admitted to us, and where classes are simply described as for "white," or "grey," no one has any right to object, the more so as at that time very large geese were worth more per pound in the market. The change in the market has brought other considerations more to the front; and the most pressing need at present is to preserve purity of race, especially in regard to the Embden. It should be seen that Toulouse entrants have the well-developed dewlap, the massive-looking, low-carried body, and ample keel of that breed; while the Embden presents the clean throat, longer neck, higher carriage, finely shaped breast free from keel, and clean-cut hardness of feather proper to it. In either breed, points of the other should be heavily penalised. The Standard of the Poultry Club is as follows:—

EMBDEN GEESE

GENERAL CHARACTERISTICS

Head.—Long and straight. *Bill :* Fairly short, stout at the base. *Eyes :* Full.

Neck.—Long and swan like, the throat uniform with the under mandible and neck—*i.e.* without a gullet.

Body.—Broad and thick ; frame, long. *Breast :* Solid, with as little indication of keel as possible. *Shoulders :* Broad. *Back :* Straight. *Wings :* Large and strong. *Tail :* Carried well out and close. *Paunch :* Deep. *Stern :* Broad.

Legs and Feet.—*Legs :* Fairly short, large, strong boned. *Toes :* Straight, connected by web.

Carriage.—Upright and defiant.

Weight.—*Gander :* 30 lb. to 34 lb. *Goose :* 20 lb. to 22 lb.

Plumage.—Hard, tight, and glossy.

COLOUR

Bill : Orange. *Eyes :* Light blue. *Legs and Feet :* Bright orange.

Plumage.—Pure white.

SCALE OF POINTS

Size	20
Breast	20
Head	12
Carriage	12
Neck	10
Colour	10
Condition	10
Legs and feet	6
	100

Serious defects : Plumage other than white ; wry tail ; or any other deformity.

TOULOUSE GEESE

GENERAL CHARACTERISTICS

Head.—Strong and massive. *Bill :* Strong, fairly short, and well set, in a uniform sweep, or nearly so, from the point of the bill to the back of the skull. *Eyes :* Full.

Neck.—Long and thick, with the throat well gulleted.

Body.—Long, broad, and deep. *Breast :* Prominent, deep, and full ; keel straight from stem to paunch, increasing in width to the stern and forming a straight underline. *Shoulders :* Broad. *Back :* Slightly curved from the neck to the tail. *Wings :* Large and strong. *Tail :* Somewhat short, carried high and well spread ; paunch and stern heavy and wide, with a full rising sweep to the tail.

Legs and Feet.—*Legs :* Short, stout, strong boned. *Toes :* Straight, connected by web.

Carriage.—Somewhat horizontal, and not so upright in front as the Embden.

Weight.—*Gander :* 28 lb. to 30 lb. *Goose :* 20 lb. to 22 lb.

Plumage.—Full and bright.

COLOUR

Bill : Orange. *Eyes :* Dark brown or hazel. *Legs and Feet :* Orange.

Plumage.—*Neck :* Dark grey. *Breast and Keel :* Sound grey, rather light, shading dark to thighs. *Back, Wings, and Thighs :* Dark steel grey, each feather laced with an almost white edging, the flights without white. *Stern, Paunch, and Tail :* White, the tail with a broad band of grey across the centre.

SCALE OF POINTS

Size	20
Carriage	15
Head and throat	15
Breast and keel	10
Tail, stern, and paunch	10
Colour and marking	10
Condition	10
Neck	5
Legs and feet	5
	100

Serious defects : Patches of black or white among the grey plumage ; slipped or cut wings ; wry tail ; or any other deformity.

CHAPTER XXXIX.

POULTRY DISEASES AND VICES. VERMIN.

FOR several reasons, to treat minutely of every disease known to occur in poultry would be of little use to the practical poultry keeper, especially as most competent veterinary practitioners now devote real study to this branch of their profession, and are able to render aid in serious cases. There are several useful special treatises accessible to the few who are really competent to make use of them*; but many causes of death which can be easily determined by a *post-mortem* examination present no symptoms during life to mark them off from others, especially to the ordinary observer, even though familiar with his birds. The skin of a fowl does not perspire (practically, at least, as there are no sweat-glands), and very little liquid is excreted by the kidneys; and the skin being covered over with feathers also, it will be seen how whole classes of symptoms must be wanting, which in other animals we can examine and form our opinion upon. Many ailments from which fowls have died, are also very rare; and upon the whole little can be done to assist the majority, except in regard to complaints ordinarily met with, and whose symptoms are fairly constant and defined.

That so large a proportion of these relate to the respiratory system, arises from the peculiar anatomy of birds. The moisture other animals excrete through the skin and kidneys, is in them almost entirely given off in breathing. In birds, also, the ordinary lungs and air-passages are supplemented by nine air-sacs, communicating with those organs, and supplying them with a certain quantity of air in the intervals of breathing. This extra oxygenation is connected with the higher temperature of the body, which exceeds fever-heat in other animals. At all events, these air-sacs expose larger surfaces to possible disturbances, including certain microscopical parasites, and the wider functions of the whole apparatus give more prominence to its work in the system, and increase its liability to disease

There is another point of view, of great importance. In a large proportion of cases of disease, the birds *ought* to die or be killed. Even where there is no constitutional taint, the fact that they have succumbed to circumstances which have not affected others, marks them out as the weakest, which unaided Nature would assuredly weed out, and which if we preserve and breed from, perpetuate some amount of that weakness in the progeny. Rheumatism, for instance, can be cured; of that there is no doubt. But the vast majority who have had such success, agree that the effects are either *never* recovered from as regards strength and vigour, or else that the original weakness continues; and the same may be said of some severe contagious diseases, such as diphtheritic roup, which may affect the strongest. On the other hand, many diseases also apparently contagious, and so attacking healthy birds under certain predisposing conditions of exposure or other coincident strain upon the system, do not appear to leave serious results behind them, and are tolerably definite in symptoms and character. It is these which may be most successfully treated, and in which treatment is most worth while where fowls of value are concerned. But it is significant that nearly all breeders who rear really large numbers of poultry, gradually come to the conclusion that, except in special cases, with valuable birds, the most economical treatment of serious disease occurring in a yard is—execution. Concerning this matter each must judge for himself.

Before proceeding with details, three other general points require mention. (1) The first is the absolute necessity for a hospital, adequate to the establishment, where sick birds can be both placed in comfort and under observation, and kept from infecting others, at all events after discovery. (2) The second is a question of dosage. Fowls are not homœopaths, and take relatively large doses, so that if any reader wants to try any new remedy, suggested perhaps by his own doctor, a large fowl may have about one-third of the dose for a human adult. Further, however, where the doses are given as two for the day, it would often be far better if the same quantity could be subdivided and given in three or four portions instead. For colds in particular, we always dose our own selves at short intervals; and between morning and night the effect of a drug has often quite ceased. There would often be more success in treating disease, with more frequent and proportionately smaller doses. (3) Never give castor-oil. This drug is almost poison to fowls, making them always wretchedly ill; and whenever a purge is needed, salts or jalap or calomel should be preferred.

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* For such British readers, *The Diseases of Poultry*, by J. Woodroffe Hill, F.R.C.V.S., "Feathered World" Office, London, may be useful. The best American work is *The Diseases of Poultry*, by D. E. Salmon, D.V.M., George Howard and Co., Washington, D.C. French readers possess *Médecine des Oiseaux*, by Pierre Mégnin; German poultry-keepers have at command *Die Krankheiten des Hausgeflügels*, by Friedrich A. Zuern.

Yet a few further remarks about symptoms. To give medicine for one or two symptoms only, is the mistake of quack-medicine vendors and of some homœopathists (not all). The same symptom may denote very different diseases, of which we will give two examples which cover, perhaps, the widest ground. Take first *lameness.* In a very young bird this denotes probably *cramp*, gouty or rheumatic. (See p. 85.) In older chickens and adults, after bad weather, and with evident pain, it probably means *rheumatism.* In cockerels almost grown, and apparently healthy in all else, it is most likely *leg-weakness.* With heat, and swollen joints, and after high feeding, it will indicate *gout.* If an open wound appear, it is *joint disease* (q.v.). And if more of a dragging lameness, especially in right leg, with evident ill-health, yellowish face, anxious eye, and evident pain in body, it probably means congestion or inflammation of the *liver.* This will explain what we mean; but we give one more instance in *cough.* Coming on gradually, of a chronic kind, with little discharge or none, poor appetite, and perhaps emaciation, it stands for *consumption.* With rather hurried breathing and a little discharge from nostrils, and some expectoration, it is probably *bronchitis*, especially if there be rattling in the throat. With still more short and evidently *distressed* breathing, slimy matter in the mouth, obvious pain and fever, and disposition to lie down, the case is probably *pneumonia.* Finally, some cough is often associated with *gapes.* It is in this kind of comparative study, from the descriptions following, that indications for treatment are to be found.

We have only further to add, before proceeding to details, that any really serious case for a *post-mortem* should be sent to a qualified veterinary surgeon. Reports rendered for a shilling or two, which speak glibly of "germs" that can only be made visible under first-class microscopes by complicated staining processes, do not inspire respect in those who know what a bacteriological examination really means. The veterinarian, if he deems such an examination desirable, will say so and get it made, for an adequate fee, at one of the establishments which do this kind of work. It will not cost a great deal, and will be reliable, and where serious interests are at stake is worth the money.

Abortion of Eggs.—This is not to be confounded with the laying of soft eggs. These last are laid when mature, and usually by fat birds: but when violently driven or startled, or subject to violence of any kind, or even if suddenly and greatly terrified, immature yolks are sometimes detached from the ovary and expelled. This is most likely to happen with pullets not yet laying but about to lay, and being a real miscarriage or abortion, may wreck the constitution of a valuable bird unless attended to. It is distinguished from the other by not occurring as a rule in fat birds; by the immaturity and small size of the yolk or yolks; generally also by hæmorrhage; and always by signs of illness and shock afterwards. Any such bird should be placed for a few days in a quiet and comfortable but rather dark pen, with a nest in case of need, and fed on a little bread and milk. Quiet rest is the main thing, but 20 grains bromide of potassium may be dissolved in half a pint of drinking water. With such care the event may be entirely recovered from.

Apoplexy.—The bird suddenly falls down, apparently dead or nearly so, sometimes quite so. The usual cause is too high feeding of the bird itself, but it may also occur upon some accidental provocation, from past generations of very high feeding predisposing to it. A cock may thus be attacked owing to a sudden quarrel, or a hen from the strain of laying. Sometimes threatening symptoms of an attack may be seen in unsteady and bewildered gait: any such bird, obviously in high condition, should be at once placed in a dark pen, fasted for some hours, and then fed several days on low diet, and given 30 grains of Epsom salts next day, and for a few days after 10 grains of bromide of potassium morning and evening. After actual attack, if not dead, lift the wing, and plunge the point of a penknife or lancet lengthwise into the large vein there seen, letting it bleed freely. When consciousness returns, which may perhaps be hastened if smelling salts or ammonia be at hand, apply some styptic to the wound, such as hazeline lotion, alum, carbolic acid, or cold water. Then place the bird in a pen, and treat as above; and afterwards take care to keep it in rather spare condition, and the blood cool by occasionally putting a few grains of Epsom salts or bicarbonate of potass in the drinking water.

Bronchitis.—The leading symptom of this is cough and quickened breathing, with perhaps a little discharge from the nostrils, but there is more expectoration from the mouth if the case is severe. The usual cause of this is a sharp change of weather or a draught. If the symptoms are sudden and serious, give fresh ipecacuanha wine, 3 to 5 drops every three hours, and, if possible, occasional inhalation of steam from boiling water, on which has been poured a few drops of pure terebene and pinol. Less severe cases may be treated by 20 grains liquorice and 10 grains ammonium chloride in a quarter-pint of water. Of course the bird will be taken care of in hospital; it is no use treating fowls with medicine, while left exposed to the conditions which made them ill. Often bronchitis finally assumes a mild chronic form, but obstinate. Such are usually cured by adding to the fountain enough of the B. P. dilute nitric acid to make the water slightly sour, with two teaspoonfuls of gum arabic and two of glycerine to a pint. Or two or three Keating's cough lozenges may be dissolved in a quarter of a pint, and given as drink for a few days.

Bumble-foot.—A corn, which may cause in bad cases an abscess, under the foot. It may be rarely caused in any heavy breed by bad perches, or daily having to jump down from too great a height on hard ground, or confinement to a stony run. But it is chiefly confined to five-toed breeds such as Dorkings and Houdans, being thus evidently a functional weakness connected with the fifth toe. It was once exceedingly common in Dorkings, in conjunction with greatly swelled (or apparently gouty) fifth toe. But care in breeding, discarding such birds as parents, has now nearly banished the trouble from many yards; and such a course should always be pursued. When the ailment occurs, while it is confined to a corn, this may be partly pared away as on the human foot, and salicylic acid ointment (10 per cent strength) applied every night, which will gradually soften the rest, if the exciting causes be removed. Should an actual abscess have formed, the bird must be kept upon straw in a pen, and the place may probably need poulticing. Whether poulticed or not, when ready an incision is made and the matter squeezed out, the wound cleansed with Wright's Liquor Carbonis Detergens and half-and-half water, and then dressed with carbolised vaseline, or aristol, and tied up with rag. Sometimes the tumour appears hard and fibrous: in that case if the incision be made in form of a cross, it can be squeezed out whole in most cases; but here the wound is better dressed with boric acid ointment. Abscesses may also form occasionally in the feet from thorns, or cuts from glass, etc. Such often appear more on the top of the foot, and are easily opened, but taking care to remove the cause of irritation if still present. These can be treated with the Liquor Carbonis and carbolised vaseline, and generally heal up quickly and well.

Chicken Pox.—This disease is rare in England, but frequent in hot climates, such as the Cape and Australia, and in America. It begins as a whitey-brown excrescence something like a carrier-pigeon's wattle, generally near the base of the beak, and extends rapidly, becoming more yellowish as it does so: sometimes it will invade the feathered parts of the head and neck. If the nodules are broken, they exude matter. It is manifestly contagious, and isolation and disinfection are the first measures. Small doses of sulphur should be given internally, with tonics and green food; the diseased spots should be washed daily with oxygen peroxide (burning the bits of sponge after), and when dried painted sparingly with a 2 per cent solution of formalin or 5 per cent of resorcin in glycerine.

Cholera.—It is not known whether this disease is really the same as Asiatic cholera in the human race, but that it is of the same type is undoubted; that is, it is a highly contagious disease, conveyed by bacilli, which are found in discharges of the rice-water type and in the blood. There are first great thirst and diarrhœa, the discharges at first generally greenish; but they soon become thin and white, often frothy. The intestines are inflamed. The bird becomes huddled and drowsy. The comb may be either pale or very dark, and death may take place either in stupor or convulsions. The disease is distinguished from mere severe diarrhœa by its rapid course and evidently epidemic character, and from contagious enteritis by the green or white instead of yellow colour of the evacuations. Death usually occurs within 36 hours. The disease has caused immense losses on the Continent and in America, Africa and Australia, but some have said it is unknown in England. We have known two or three outbreaks, and the disease has also been reported on by Prof. MacFadyean. Treatment of birds attacked is practically hopeless; but in the British climate at least, an outbreak may be stayed by instant isolation, careful collection and disinfection of all infected evacuations by strong carbolic acid, and the addition of 20 grains salicylic acid to every pint of water. Every dead bird should be burnt. Where the disease is most prevalent, recourse must be had to Pasteur's vaccine; this being, in fact, the very first disease from which that eminent man prepared any preventive anti-toxin. The bacteria were by him cultivated in chicken-broth exposed to the action of oxygen; and by inoculating healthy chickens with this attenuated virus a mild disease is produced which makes them immune, as vaccination does to small-pox. The vaccine can be obtained, in case of need, from the Pasteur Institute in Paris, and out of thousands of inoculations, scarcely any have failed to produce immunity. For practical purposes, no other treatment is of any avail in a real epidemic of this disease, which so far has been happily rare in England.

Cold or Catarrh.—This is common enough in winter, from the same causes as amongst ourselves, though there is little doubt that even these mild diseases are contagious, so that a cold will "go through the house." The main symptom is watery discharge from the nostrils, and, perhaps, a little frothiness at the eyes. There may be a little sneezing and feverishness, but it will be sneezing and not coughing, and there may be a little diarrhœa. It often gets well of itself if the weather improves and the birds are taken care of and well fed, being kept out of draught and wet. If seen very early, the best treatment is about five drops essence of camphor on a bolus of meal, followed by a 1 m. tabloid of aconite every four hours for a day, and one morning and evening next day. Meanwhile the nostrils should be squeezed out and syringed gently with hazeline tincture in equal parts of water. Another good early treatment is a 2 grain tabloid of quinine at once, and then night and morning. This treatment is only of use early, however; if the catarrh has become confirmed, the nostrils and throat should be cleansed with peroxide of hydrogen and equal parts water several times daily, and the nostrils greased with vaseline which has been melted and mixed with 5 per cent eucalyptus oil. Internally, 20 grains Epsom salts may be given, followed up by two or three drops each of eucalyptus and pure terebene on a meal pill every three or four hours, or half a teaspoonful of each may be poured on the bird's fountain. It is also of much benefit to give them a thorough fumigation at night with some sulphur on a red-hot shovel, or a teaspoonful of eucalyptus on a shovel not so hot; it will make them sneeze, but do them good. If the catarrh does not yield to this treatment, that for *catarrhal roup* should be adopted.

Consumption.—See "Tuberculosis."

Cramp.—This complaint in young chickens has been sufficiently treated of at page 97.

Crop-bound.—This term denotes a crop so gorged as to be hard and tense, in which condition food may be unable to pass out, and the bird may die if not attended to. No fowl gorges itself in this way at the time, but if fed irregularly and carelessly, so that it eats freely of grain when very hungry, the dry grain swells with the moisture, and so causes the mischief. The first measure is to dissolve a little Epsom salts (not much) in warm water, and giving the bird a spoonful at intervals, very gently to knead the distended crop with the fingers. It may take one or two hours, but generally the contents can be moved and made softer with patience. If this can be effected, give then 30 grains of salts in water, and leave the bird in a pen. No further food should be given till the organ is nearly empty, and then for several days only a very little biscuit-meal, with a little perchloride of iron in the water, in order that the crop may contract; else the case is likely to be followed by the ailment described in the next paragraph. If these measures fail, however, an incision must be made, choosing a place near the top free from any large blood vessels, and, after plucking a few feathers, making a cut about 1½ inches long. Through this the contents must be all removed with a small teaspoon, and when empty it is safest to pare the nail of one finger very short, oil it, and feel that the outlet is open and free, as in some cases a piece of bone or other hard object may be found impacted and so have caused obstruction. The edges of the wound should then be washed with dilute carbolic acid, and the edges sewn together. This is as well done by a white silk thread which has been kept in the carbolic till the time has come to use it, and continuously, like one seam, taking inner and outer skin together; but most professional doctors would make several separate stitches through the inner skin first, and then through the outer skin in the spaces between the others. The wound will heal up either way. The bird should have no water for 24 hours, and be fed sparingly for a few days on biscuit meal or bread and milk, not too moist. There is very seldom any trouble if the operation is done in good time, and it should never be delayed after it is once clear that the crop cannot be evacuated by the first milder measures; as the contents gradually begin to putrefy, and the tissues lose their healthy condition, after which healing may not take place. In some cases, where a contributing cause of the attack has been a crop already over-distended from some previous occurrence, the bottom of which hangs loose and pendulous, so that this portion of the food cannot pass outwards, but lies there decomposing, a modification of the operation is advisable. In this case a longer incision should be made, transversely across the front of the crop, and lower down, about at the centre; and a considerable piece of bay-leaf shape should be cut out entirely. When this is stitched up properly, the slack is taken out, and a great deformity and source of danger removed. This operation is as easy as the other; but owing to the lower position of the wound, and its transverse character, the bird must be very carefully fed for a longer period before being left to itself.

Crop, Soft or Swelled.—In this complaint the crop is also large and full, but the contents are fluid, generally very much like foul or dirty water, which is easily expelled if the fowl be held with the head downward, and the crop squeezed a little. From many cases we have investigated, the causes appear to be two. One is a continuance of the relaxed pendulous condition referred to above, the sour and foul food left in the bottom of the bag gradually bringing the lining membrane into an unhealthy catarrhal condition. This admits of remedy by emptying the foul contents thrice a day, and only feeding sparingly two hours after with a little scalded Spratt, in which some wheat grains are interspersed, with a little grit; after each feed let the bird have a little chopped onion, and drink a little only of rather strong brandy and water, in which 1 grain of perchloride of iron is dissolved. The food itself may be also seasoned a little with the No. 1 mixture on page 199. If with this treatment and care the foul secretion ceases, the operation described above should be carried out; but it is useless otherwise, as the wound would probably not heal while the organ was in an unhealthy state. Other cases, apparently very similar, appear to be a sort of dropsy, caused by defective nutrition or circulation in the system at large. Even such cases may often be alleviated by occasional doses of jalap or salts, with iron in the water and 2 grains iodide of potassium twice a day; but such a state denotes wreck of the entire system, and the bird is totally unfit for any real purpose, and should be killed. These latter cases sometimes follow excessive over-showing.

Debility.—Fowls, when first kept by inexperienced persons, in small runs, often appear weak and anæmic generally, without any very definite symptoms. Usually the great want is light and air, which above all must be supplied, and all birds which are too many for the space cleared out. The necessities of green food and cleanliness should next receive attention, and possibly animal food also may be needed, which can be judged from what has been said in our early chapters. These matters being put right, and exercise in various ways encouraged, some cod-liver oil should be given if the birds are thin, and in any case iron tonic or Parrish's Chemical Food in the drinking water, or 2 grains carbonate of iron may be given to each daily in a pill for a time. This simple treatment usually causes rapid improvement. Condiments should be carefully avoided in such circumstances, doing more harm than good.

Diarrhœa and Dysentery.—Diarrhœa may occur at any time without anything very serious being the matter, from change in food, or even sudden cold or wet, which often causes a sort of catarrh of the bowels. Slight cases may often be met by giving first of all 20 grains of Epsom salts, afterwards mixing the food rather dry, with a portion of rice in it boiled firm in whole grains, sprinkling the whole with chalk; or, if apparently the weather has been the cause, season the mash (still mixed rather dry) with No. 1 mixture on page 199, and on a small bolus of food give about six drops essence of camphor. If more than this seems needed, an excellent prescription is that given by Mr. Tegetmeier, many years ago, of:—

Rhubarb	... ...	5 grains
Chalk	... ...	5 „
Cayenne	... ...	3 „

To be given as a pill morning and night.

If still obstinate, or very severe, add ½ grain of opium to three or four doses of above, or try instead (not in addition) 3 to 10 drops of chlorodyne every three hours. Very severe cases, in which the evacuations are tinged or mixed with blood, have really become dysentery, and are often fatal; but are sometimes saved by 5 to 10 drops of chlorodyne given as described. The best treatment, however, which has been successful in some instances that looked almost desperate, has been the administration of 5 grains sulphur and 1 grain Dover's powder every four hours for a day or two. A very favourite remedy for, and preventive of simple diarrhœa, in America, is Venetian Red (red oxide of iron) in the water.

Diphtheria.—This dreaded contagious malady was unknown in England till about 1876, when it suddenly broke out and spread to such an extent as to be written about for months under the name of "the new disease," being chiefly spread by birds which were purchased, or had returned from shows. The marked symptom is the appearance of diseased growth in the throat and inside of the mouth, resembling raised patches of whitish or pale yellowish skin, which may invade the entire throat and mouth, often also appearing like ulcers or sores on the face, comb, and about the eyes. It was first treated by caustics, with practically no success: we were the first to detect the true diphtheritic nature of the malady and to prescribe for it as such, and since then it has been found curable to a considerable extent. It very often commences as roup, and has been confounded with that disease; but it is a true diphtheria, propagated by a bacillus which has been isolated by Löffler and others, and the truth seems to be that the mucous surfaces already inflamed, and the system already weakened by the roup, are peculiarly unable to withstand infection from the diphtheritic bacillus. Even in a recovered case, the disease so greatly affects the strength and constitution that such a bird should never, if possible, be used for breeding; and it is, moreover, by no means certain that the disease is not communicable to man. About 1895 that question was believed to be settled in the negative; but further investigations since have revived the doubt, though the general opinion of bacteriologists in America still is, that cases which have been observed there of a sort of diphtheritic sore throat rather common among poultrymen working amidst an outbreak, is of a much milder type and distinct from diphtheria in man. Of course cases which have begun as roup will have been treated as such, and the treatment will so far have been good; some have thought, in fact, that hydrogen peroxide freely applied from the first, has often aborted or prevented further growth of diphtheric membrane. As soon as any such growth is found, however, the diseased surfaces should be assiduously painted or swabbed several times a day. A thoroughly good lotion is one of the earliest we gave, as follows:—

Carbolic acid	1 drachm
Sulphurous acid solution ...	3 drachms
Tincture perchloride of iron	4 ,,
Glycerine	4 ,,

With this paint all the sore places, morning and night, also removing any membrane that will come off pretty easily, and burning all such carefully. Now and then a drop may go the wrong way and choke a bird, but this can be avoided with care, and some such dressing is necessary. Quite as good an application, and often better, is to make a swab of cotton wool tied on the end of a stick, and well swab the mouth all over, especially diseased places, with hydrogen peroxide, full strength: it should not be taken from the bottle, but some poured into a saucer, not to contaminate the bottle, throwing away any not used, and burning every swab after use. Remove, as before, any of the growth that comes readily. Open and squeeze out swellings on the face, and cleanse with the same fluid; but if necessary to cleanse the eyes, use for this a dilution of two parts water, or a solution of boric acid 15 grains to the ounce. After this dressing, touch all parts, except the eyes, with aristol powder; or, still better, apply with a brush a 2 per cent. solution of formalin in glycerine, or resorcin in glycerine of the same strength. On the whole these last dressings are the most efficacious of any we know. For the throat tincture of iodine may also be used, if it happens to be at hand, and other things are not. For internal use, get from any chemist a bottle of his ordinary sore-throat mixture of potass-chlorate and perchloride of iron, and give about a sixth to a third (according to size of the bird) of the ordinary human dose every three hours for two days—all chemists make a mixture of this kind, but rather differing, and each will state his own dose, which will turn out about the same in the end. Some may prefer to try a homely treatment much used in France, and easily carried out. Equal measures of tar and turpentine are mixed, and, the house being well closed at night, enough of the mixture is burnt to fill it with thick black smoke, so plentifully as to "black" the birds. They sneeze and cough violently; and, though this remedy is not equal to the foregoing in advanced cases, it has often proved effective when employed in good time, the false membrane being detached, and the throat returning to a healthy state. It also appears to stop infection of the rest. Whatever form of treatment be adopted, feed on the very best soft food mixed with weak brandy and water, and if the bird seems very ill give a raw egg and brandy once a day. When convalescent, nourishing food and tonics will be called for. All dead bodies, as well as foul swabs and rags, should be carefully burnt.

There are one or two other diseases which rather resemble diphtheria, and no doubt often pass as such. The mouth is sometimes found coated with a sort of white "thrush," and occasionally the air passages and the throat are infested by microscopic vegetable moulds of the *Aspergillus* family, which are found in quite thick growths, an eighth of an inch deep, or even more. These last are generally yellowish, with a pale green cast. As a rule, however, these growths when present are lower than the throat, and not therefore to be observed during life, though readily seen under the microscope whenever found *post mortem*. Diphtheritic treatment would probably be as good as any, but any treatment is rarely successful in such cases, which are, fortunately, not common. It is of chief practical importance to remember that these vegetable microscopical growths are generally introduced through the medium of "musty" grain or straw, on which they may often be found.

Dropsy.—The abdomen is sometimes found distended with fluid so as almost to touch the ground. The bird may often be apparently relieved by tapping the fluid and giving 5 grains iodide of potassium daily. But it is worthless all the same, and if exhibited and claimed by someone else, the proceeding can scarcely be deemed honest.

Egg-bound.—Inability to pass the matured egg is of frequent occurrence. The bird either goes often to the nest or remains long there, but without laying. Neither of these is any proof; but if such a bird, when off, walks with evident distress, perhaps with wings nearly touching the ground, it is probably a case, and gentle examination with the fingers will make it clear. The cause may be a large, double-yolked egg; or it is not unusual for a pullet to have trouble with the first egg or two, till the sphincter-muscle is stretched; or the difficulty may be the result of too much fat, a condition which should be seen to at once if it be found; or finally the oviduct may be rather inflamed, and form a very rough shell. In most cases it is sufficient to gently inject a tablespoonful of olive oil from a small flexible syringe, or to lubricate the vent and cloaca with the finger repeatedly dipped in oil, and then hold the part over a jug of boiling water for a quarter of an hour. If the bird be then placed on the nest she will probably soon lay. The process may be assisted by about five drops of tincture of ergot every four hours, or 30 grains of Epsom salts, or a tablespoonful of hot treacle made into a sort of thin pudding with finely-chopped groundsel. If such measures fail, the egg should, if possible, be gently manipulated from outside towards the vent, till its end can be seen. Then this may be punctured, the egg emptied with a very small spoon, and the shell crushed and removed with tweezers, the oiled finger being passed afterwards to make sure that nothing is left. Should the egg break of itself, the accident is almost always fatal, leading to peritonitis. A little cooling medicine should always follow cases of egg-bound.

In the effort to lay, the oviduct is sometimes extruded. This may sometimes be cured by gently anointing with carbolised vaseline and returning, giving 3 drops tincture of ergot. Afterwards it may need returning several times, which should be followed by injections of hazeline tincture and water, keeping quiet. Laying should be suspended, however, for which there is nothing better than Mr. Tegetmeier's old prescription of 1 grain calomel and $\frac{1}{12}$ grain tartar emetic, followed by low diet, and especially discarding meat and condiments for a while, until the bird is got into more spare condition.

Egg-eating.—This vice has been sufficiently dealt with at page 61. Another expedient pretty effectual is to keep the beaks of offenders cut back for a while sufficiently to be tender, feeding on mash meantime.

Eggs, Soft, and Abnormal.—Soft eggs may be caused by lack of shell-material, which, if discovered, points to the remedy, the most rapid being pounded raw oyster-shell. Or they may be caused by the fowls being driven or frightened, in which case they soon cease, and nothing need be done unless the injury has been so severe as to prematurely detach small and unripe yolks, when the case becomes a real *abortion* (q.v.), or they may be caused by condiments and too much animal food, spices in particular leading frequently to all sorts of trouble with the egg-organs, particularly in the Mediterranean races of poultry. A few small doses of Epsom salts or jalap, and cessation of the extra stimulus, will remedy this. But far the most usual cause is simple over-feeding. A little careful investigation will find what is in fault, and that will indicate the appropriate remedy. Want of shell material is far less common than it used to be; over-feeding or over-stimulation probably more so.

Of the other kinds of abnormal eggs the very small ones, only containing albumen, need seldom occasion any anxiety. They usually occur at or near the end of a batch of eggs, and merely show that the ovary is exhausting its supply of ova and yolks a little before the secreting parts of the oviduct are quite ready to suspend business. Neither need an occasional large double-yolked egg cause concern, as it may be due to a hen occasionally "holding up" one ovum till another is also ready. But any frequent occurrence of such eggs is a proof of over-stimulation, and should be met by a little cooling medicine, or less meat, or more green food; not, however, overdoing any such changes if things on the whole look pretty well.

Eggs, Spots in.—Small spots of blood are occasionally found in eggs. They may occur in the yolk, which means a slight hæmorrhage in the ovary, or in the white, which locates it in the oviduct. An odd instance or two means little, and in fact can seldom be identified; but a series at the breakfast-table points to a definite inflammatory condition, caused usually by condiments, or too much meat, or constipation. The remedy is obvious. Black spots are more rare, and may mean an early stage of gangrenous ovary, which has once or twice occurred in America in epidemic form, and is probably due to bacteria. For this reason, whenever such occurs the bird should if possible be separated, and carefully treated by herself till it is seen whether the spots cease.

Enteritis, Contagious.—Simple enteritis or inflammation of the bowels is sometimes found in poultry on post-mortem examination, and may, of course, occur in them from irritating food, as in other animals; but they can stand more than most creatures in the way of diet, and it is very uncommon, and not very distinct in symptoms from other complaints during life. Most cases found have occurred from corrosive *poisons* (q.v.), such as arsenic, phosphorus, or unslaked lime. But there is a highly contagious form of enteritis of which destructive outbreaks have occurred on several occasions, and which has been described by Dr. Klein.* Being called in, he states, to investigate a contagious malady from which 400 birds had died on a poultry farm at Orpington between March 1888 and March 1889, he found a clearly marked disease entirely distinct from cholera in several obvious respects, though there was some general resemblance in others, so that the complaint appears to have been observed in America and confounded with cholera on several occasions years before. As already described on page 9, on the farm attacked four or five hundred birds had been kept on two acres of land. The fowls did not appear ill till twenty-four or thirty-six hours before death, but from his experiments in feeding and inoculating the poison, these earliest symptoms do not appear to occur until three or four days after the first actual infection. The birds become inert, but not sleepy as in cholera; and the diarrhœa, which is the clearest outward symptom, is yellow, or the colour of thin mustard, instead of being greenish or white. Great thirst is always present, with often dark comb, staggering, and ruffled plumage. Post-mortem examination showed that the spleen and liver were greatly enlarged and softened, the heart filled with stagnant blood, and the intestines inflamed; and the evacuations, intestines, blood, and much of the above structures swarmed with a bacillus, which could be cultivated by the usual bacteriological methods on gelatine or in broth, and when so cultivated, reproduced the disease by inoculation into healthy fowls. The rapid spread of the contagion was obviously accounted for by the fowls eating grass or other food contaminated by the evacuations of diseased individuals. Thus the disease is readily communicated, and in point of fact outbreaks due to imported birds have been observed in Ireland and elsewhere.

No treatment was found to cure birds once attacked; and although more recently we have reason to believe that some genuine cases have been pulled through, the disease is so fatal, and so easily spread by fowls apparently well, that we do not think direct treatment desirable, even if such results should be confirmed.* Effort should rather be directed to stamp out the epidemic, by instantly separating all diseased and suspected birds, and removing the others to clean ground; watching these carefully, and removing at once every fresh one that is noticed with thirst and fluid diarrhœa; cremating all dead bodies; and disinfecting the runs with quicklime, afterwards dug into the ground, and leaving them empty for some time.

The next thing is to protect the remainder. Terrible as this disease is in its effects, an unjustifiable use has been made of it by several writers who seem more really anxious to oppose poultry-farming than to give useful information. Fowl enteritis is not the necessary result of even over-crowding, since it never appeared in many cases we know of where crowding had long been worse than even on this farm at Orpington; and on the other hand, it has been introduced by infected birds and proved ruinous, where there was no crowding at all, as in Ireland. Those who so greedily seized upon it as a mere argument to serve their purpose, have (so far as we have noticed) carefully abstained from stating that Dr. Klein succeeded in preparing a *protective anti-toxin* or vaccine. Dr. Klein grew his cultures of the bacillus in faintly alkaline broth kept at 35° to 37° C (95° to 98° F). He heated some of this culture to 55° C (131° F) for fifteen minutes, and then injected 5 cubic centimetres of the preparation into eight healthy birds All of these were quiet and off their feed by the sixth to the eighth day, but had no diarrhœa; and in a few days apparently recovered. They were then inoculated with the virulent culture, with two untreated fowls to check or "control" the experiment. The two controls both died; and one of the inoculated also died with enlarged spleen and showed bacilli; but the other seven were unaffected. This being not quite successful, a virulent culture was next similarly heated for twenty minutes, and 5 c.c. again injected into eight healthy fowls. All were quiet and off food on the sixth and seventh days, but had no diarrhœa, and by the tenth day they appeared well. They and two more controls were then infected; the two untreated controls died on the seventh day as usual from typical enteritis, but the others remained perfectly well. This then is Dr. Klein's preventive vaccine, which can be prepared from these particulars by any competent bacteriologist, and disarms this fatal disease of much of its terror. A broth culture for preparing it should be recent, and only needs to be incubated from twenty-four to forty-eight hours.

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* "The Etiology and Pathology of Grouse Disease, Fowl Enteritis, and some other Diseases Affecting Birds." By E. Klein, M.D., F.R.S. London: Macmillans.

* Up to the time of writing we have been unable to obtain such definite information as we could wish, either as to the results or the treatment; it is not, indeed, often that experiments can be made. In one case we believe the treatment was the administration of 1 drop Calvert's No. 4 carbolic acid every six hours, with chlorodyne, raw eggs, and tonics. Probably greater success might be obtained by the administration of creoform, a compound of formaldehyde and creosote. This latter is a new drug, neither poisonous nor irritating, which may prove useful in many intestinal complaints. It is insoluble in water, but can be given in brandy.

Favus.—This formidable disease was at one time, and still is by some writers, treated as if only a severer degree of "white-comb," from which it is entirely distinct. It is caused by a microscopic vegetable parasite or fungus, on account of which origin it may attack the most healthy fowls, and is highly contagious. The same fungus is known to attack man, dogs, cats, mice, rabbits, and horses; and one severe outbreak reported to us lately was probably due originally to an infected pony in an orchard rubbing itself against the trees. The fungus is named *Achorion schönleinii*, and is one of the contagions most easy of any to observe under a microscope, in spite of its minuteness. If a particle of one of the scabs be taken, moistened with dilute acetic acid, and crushed on a microscopic glass slip, a power of × 500 or even less will show distinctly a quantity of thread-like bodies, or mycelium, in which are developed spores, which also abound in a detached form. No microscopist can miss so much as this; and more careful examination will show that the fungus even penetrates the shafts of the feathers in severe cases. The disease has lately become very common, and for some reason Anconas have appeared to be specially subject to it—perhaps from their fighting proclivities. At one of the largest shows in 1901 we noticed the disease as next predominating in the Buff Orpingtons, and of these two breeds there were numerous cases at this one show. Unless allowed to become very bad, leading to loss of feathers on the head and down part of the neck, the general health seems but little affected, and the fowls lay as usual; but in severe cases the health fails and the bird dies of weakness. The first symptoms usually noticed are small white or yellowish spots or papules on the comb, which have a thin scale or crust. These crusts seem to extend, rather raised at the edge and lower in the centre like a shallow cup; they also multiply and run together. When removed, the skin underneath is red and excoriated. If neglected, the eruption extends to the head and down the neck, one of the little cups often surrounding a feather, or the hole where the feather once grew, and even the region of the vent may be invaded. Birds allowed to become so bad as this usually die of debility, and are difficult if not impossible to cure; but while confined to the comb the disease may be successfully treated.

For successful treatment, and impunity in handling it, the nature of the disease must be borne in mind. Being a vegetable fungus, many of the usual insecticides are of little or no use; also it should not be forgotten that the invisible spores are being detached as dust and floating about, and if they reach any scratch or abrasion on the hands may attack them; this has several times happened. They do not appear capable of rooting themselves on sound and healthy skin, but the least scratch on a bird's comb, in an infested yard, will probably be at once infected, the whole scratch being marked by diseased growth in a day or two. Hence two cockerels which have fought will quickly both develop the disease if it exists near them, and there is reason to believe that even a flea-bite or wound from a tick may give footing to the germ. For local treatment we have several resources, all the following having proved effectual, but it may be as well to say that carbolic acid is unsuitable, as enough of it to be effective would be absorbed into the system, and prove poisonous. First of all, as we have seen above that dilute acetic acid softens and breaks up the growth, we may wash the affected parts with vinegar, and after drying off that, strong brine or solution of nitre in water will kill a great deal of the fungus: this treatment followed up has mastered several outbreaks. Another application which has proved effectual is tar and sulphur, provided the way has been first opened to the spores by either the vinegar or a good wash with hot water and soft soap. The most powerful dressing is corrosive sublimate, strength 1 in 1,000, but it must be remembered that this is a strong poison, and in water almost tasteless. For these reasons it should be dissolved not in water, but in methylated spirit, applying with a brush to all the affected places night and morning at first, and later on once a day. Another very powerful dressing is solution of resorcin, 40 grains in an ounce of water. With any of the applications, a wash with vinegar should be given occasionally, as this increases their effect for the reason stated above. The most rigid cleanliness, burning of all matter removed, and for the birds themselves good food and tonics, should not be forgotten.

Feather-eating.—Fowls in small space especially, but sometimes in other circumstances, often develop the deplorable habit of devouring each other's plumage, plucking out the feathers even till blood flows. Some of the varieties appear more subject to it than others. Causes and remedies are various. There is no doubt that insect vermin are often the cause, the birds plucking their own feathers from irritation, or seeing them crawl on others, and pecking at them, and some writers state that this is always the cause. That is not so; as we have repeatedly been consulted where the conditions were of the best and the strictest scrutiny could find nothing of the kind; in these cases there is obviously an appetite that craves for something not found in the dietary. Moreover, we must place in the same category the habit of pecking at the comb and face, in which case almost invariably the hens alone are guilty, and the cock remains unmoved, almost as if he liked it, though his comb and wattles are being torn to pieces. But when unchecked for a time the habit becomes an inveterate vice, very hard to cure. Naturally various remedies are occasionally effectual. Where animal food has not been given, meat or cut bone has stopped it sometimes; in other cases plenty of greens, especially lettuces, have succeeded. The administration daily of 10 grains sulphur and 5 grains of chlorate of potash has in many instances worked wonders; and so has one-eighth grain daily of acetate of morphia, with bi-carbonate of potash in the water. It is worth remarking that a bad case broke out in a breeding-pen at the great New York show of 1902, and that the owner was assured by a Canadian breeder it could be cured by salt properly given. He accordingly purchased a Bologna sausage, cut it up, salted it somewhat further, and fed it to the birds. It is stated positively that they ceased at once, and the occurrence seems worth recording, though we have never known any particular treatment always successful. Another treatment is the administration of sulphuret of lime, which has been repeatedly stated in *Poultry* to be very successful. It is prepared as follows: Put three or four lumps of fresh burnt lime, the size of eggs, into an iron pot, slack the lime with boiling water, then stir into the lime about 6 ozs. of flowers of sulphur, add gradually two quarts of boiling water, stirring all the time; then boil gently for an hour or so, pour off the clear liquid (which will be the colour of dark brandy), bottle and cork well. A second boiling may be made with fresh water, but the liquid will not be so strong. A tablespoonful of this liquid to every six hens, put into the water used for mixing the meal, is the best way to give it. Given daily, or twice a week, it is stated that this preparation will keep the fowls' plumage in good condition, and soon put a stop to feather-eating. The mixture should be kept away from the dwelling-house, otherwise every time the cork is removed from the bottle the whole house will be filled with the sulphuric vapour given off from the liquid. Full bottles not in present use should be well corked and sealed, and kept in a cool place. If vermin are found, that of course must have attention. Other measures should be taken of a more general character. Any bird specially attacked must be secluded; and so also any special culprit, before she has finally corrupted all the rest. The numbers must be reduced in proper proportion to the space; and when this is confined, care must be taken to provide occupation, as suggested in earlier chapters, for it is largely idleness in confinement that has to be combatted. The birds should further be made nauseous to each other, by drenching their plumage with either Jeyes' Fluid, or Wright's Liquor Carbonis diluted with two parts water, or a strong solution of quassia in water, and applying carbolated vaseline freely to the bare places, which will also promote re-growth. Also the edges of both mandibles should be filed away at the tips, so that for an eighth of an inch back they do not quite close: the quick need not and should not be touched, or the bird could not peck, but when properly done it can pick up corn, while unable to get hold of a feather. Some hens appear quite incurable, being then utterly useless except for exhibition; but intelligent use of one or the other of these methods will in most cases be successful.

Fractures.—A fracture of the shank can generally be treated quite satisfactorily, placing the bones in position, and applying a splint by wrapping around some soft brown paper saturated with white of egg, which stiffens as the albumen dries. A broken wing is not so easy to manage, and little can be done beyond getting the bones in proper position as nearly as possible, and then tying the quill feathers together to prevent movement as far as possible. The result is very seldom perfect in the case of a wing, but a valuable bird may in this way be often preserved for breeding.

Frost-bite.—This is not very uncommon, especially in the north. The comb really turns pale first, but is seldom noticed till the edges become dusky or livid, or finally black, and as a rule the health seems little affected, though part or the whole of comb and wattles may drop off. If the first stages were noticed the best treatment would be, as usual with ourselves, sharp friction with snow or ice-cold water, but the time for that is usually past when observed. In the United States, where this accident is more frequent and more severe, the best recommended remedy is lard 2 ozs., quinine 1 oz., kerosene 3 ozs., melting and incorporating all together. Gentle friction with this is said to cure even bad cases, if not left till altogether too late. Others use vaseline 5 drachms, glycerine 2 drachms, spirit of turpentine ½ drachm. Frost-bite may be largely prevented by well greasing all over the comb and wattles every day in very frosty weather.

Gapes.—The disease well described by this name carries off hundreds of chickens and very young birds in England, and is still more destructive in France and America. Every chicken which opens its mouth and gapes, has not however got the "gapes": such an action may be seen in healthy birds. The real disease is most common in England from two to six weeks old, but may occur at a week, or after several months, and is shown not only by the frequent gaping, but by the bird appearing also unwell, coughing and sneezing occasionally (in which process the worm may often be seen to be coughed up), getting weak, rough in feather, and often standing with closed eyes. When badly affected, a few die from suffocation, but more from weakness and exhaustion, as the worms prey upon the juices as well as obstruct breathing. The disease is as destructive amongst pheasants as poultry, also among other birds. It is caused by a small reddish worm now known as *Syngamus trachealis*, the male and female of which are almost always found together in conjugation in the form of the letter Y, the main stem being the female and varying from half an inch to as much as 1¼ inches long, the attached male about one-fifth of an inch. The worm attaches itself to the surface of the trachea or windpipe by both its mouths, or both tips of the Y. Out of hundreds of specimens found and extracted, we should estimate that not 10 per cent. were single or uncopulated, and it is likely enough that even of these the male had adhered by its own mouth to the chicken, and been torn off. The greatest number we have ever known in one bird was thirty-five worms, or pairs. The disease was once believed to be only one of chickens or very young birds, an opinion which we formerly shared; but as we have since found many specimens in full-grown fowls, and as the larger and stronger chickens attacked often recover without treatment, the truth appears to be that such birds can endure a moderate number of these parasites without serious suffering, until they have run their course and been ejected.

The eggs of the gape-worm do not exceed $\frac{1}{250}$th of an inch in diameter, and there are many thousands in the body of one female. They are not laid, but liberated by the disintegration of her body, each egg containing when mature a small white embryo; and it was found by M. Mégnin that these never hatch *within the parent*, however mature, but will do so and liberate the embryo wherever they have moisture and a heat of not less than 68° or 70° F. Hence they will hatch in damp earth or tepid water, and he kept some alive in water alone at the requisite temperature. There is no doubt that such polluted warm water will communicate gapes, the embryo commencing to grow whenever it reaches the trachea of a chicken; and possibly the egg itself may hatch there, though all known facts appear to negative the transmission of gapes by swallowed eggs alone. Hence Mégnin concluded that no intermediate host is concerned in an outbreak of gapes. Others have affirmed the same, and a leaflet issued by the Board of Agriculture in 1901, after alluding to statements made in *The Illustrated Book of Poultry* thirty years ago, and repeated presently, concerning the probable connection between gapes and insect vermin, affirms, "Needless to say there is no connection whatever." To ignore a large quantity of positive evidence on the ground cited, does not exhibit so much the superior scientific knowledge evidently supposed, as an ignorant dogmatism which under pseudo-scientific pretences has done so much harm in many cases besides this, and would for instance have prevented the recognition of vaccination for small-pox. The fact proved is simply that the life-cycle of the worm requires no real "host" for any stage of its development; but whether it does not *practically depend upon some carrier or bearer* in the majority of outbreaks, is quite another thing, and there are further facts also known which make this a very practical question. (1) It is known that the eggs are often found in large numbers in the digestive canal of both the large and smaller earthworms: we have seen many such under the microscope, and in a few cases in summer free embryos, but these latter have never appeared to us to show any *growth* whilst in the worms. (2) They have also been found in and upon small molluscs in water. (3) It has been proved that infected earthworms fed to chickens may produce gapes: but we could never obtain enough infected molluscs to test that matter, which is worth investigation. (4) The most remarkable facts, however, are the following: Whole worms coughed up are eaten by young chickens most eagerly, and every worm contains, as already stated, many thousands of the ova; but in *clean*, healthy chickens never but very few worms, and often none at all, can be found after this in the trachea, if the chicken be kept apart! It looks as if the fresh worms and their ova passed through the digestive canal, most of the ova being voided unhatched; or, in other words, a certain *time* seems needed for maturing. Dr. Salmon states as the result of experiment that ten to fifteen worms (containing many thousands of eggs) have been *fed* to a single chicken, with the result that only four or five worms at the utmost ever appeared in the trachea; and he accordingly acutely remarks, in reference to the path of the parasites from the digestive canal to the trachea, that "no doubt the path is a difficult and dangerous one for them." Still later Dr. Francis A. Winder, of Glasnevin, co. Dublin, made experiments, of which he has kindly given us some details (besides the general results stated in an article in the *Medical Press*, of Feb. 12, 1902). In June, 1901, he penned a male and female chicken a month old, and on June 7 gave the male two worms; on June 10 the female was given two worms; on June 20 four worms were crushed and mixed with food, all which was eaten; and on June 27 worms were placed in the drinking water, which was left unchanged for a week. Both remained perfectly healthy; the cockerel being killed and eaten at Christmas, and the pullet being alive and laying in March, 1902. It is clear that *fresh* worms and ova can be eaten with safety, and pass through the digestive canal to the vent unhatched. It is well established that in the case of the thread-worm (*Oxyuris vermicularis*) children re-infect themselves by scratching alternately at the anus and the nostrils. And these later researches seem to make it probable that where a chicken is infested with insects, which can range over its body freely, and many of which insects can be *seen* to resort occasionally to the nostrils, either for moisture or some other purpose, ova may become attached to them in the neighbourhood of the vent, and, after thus spending sufficient time to ripen, or perhaps even hatch, be conveyed from that region, in a state ready for growth, to those portals of the trachea. It appears to be established that in sufficiently warm, damp seasons the ova will also mature, probably into embryos, on the damp grass, and so infect the chickens; but all the facts seem to render necessary some such course and means of conveyance as here supposed.

This brings us to treatment, and has been given as bearing upon one method which has been so well proved, that practical men will hesitate to sneer at it. About 1865 the late Mr. Halsted, of New York State, found on his chicks some large insects—apparently ticks, though he figures a louse—ranging from two to a dozen, and whose heads were embedded in the skin. He cleared one brood assiduously, but not the others. That season he had gapes badly, losing all or part of the other broods, but *not one chick* of the brood he had cleared. Picking was tedious, however, and Mr. Halsted compounded the following ointment, except that we have modified it for the official mercurial ointment of the British Pharmacopœia:—

Mercurial ointment	1 oz.
Sulphur	½ "
Crude petroleum	½ "
Lard	2 "

This he applied to the heads of the young chicks when putting them out (sparingly, or mercurial poisoning would be produced), and afterwards he never lost a chicken of those so treated. Other experience in America corroborated this. Not only so, but after we had published this treatment, breeder after breeder testified to its success in the *Live Stock Journal*, particularly during the widespread epidemics of 1880 and 1881. With only a few it failed, and there chiefly through poisoning by carelessness in application. Facts of this kind are not set aside by sneers, and the practical breeder who finds his yard in danger will be slow to neglect a precaution which is so easy, and will, at all events, benefit his young stock in other ways. It is significant in the same direction that gapes has been found much less severe where chicks have been hatched and reared artificially in detached broods.

When the disease has actually broken out there are various remedies. As a preventive for other broods which may be coming on, camphor in the water has undoubtedly some efficacy, and every vessel should be weekly scalded. The old-fashioned cure was to strip a small quill-feather, all but a small tuft at the point, and (moistening it in turpentine or not) introduce it into the trachea, turn it round, and withdraw it with the worms. This is effectual, but requires care to prevent lacerating the windpipe or causing suffocation. In this way thirty worms have been successfully extracted from one chicken. A very much better method is to take two *straight* hairs from a horse's tail, laid together, tie a knot on the end of the pair, and cut off the ends close to the knot. This is passed straight (*i.e.* without twisting) down the windpipe as far as it will go without bending, then twisted between the finger and thumb and drawn out. A trial or two may miss, but usually five or six attempts will bring up four or five worms, and the hairs inserted in this way, without twisting, do not seem to hurt the chicks, and are used with the greatest facility. The bringing up of even from four to ten worms, and the failure of more to come after a blank trial or two, may usually be reckoned as a cure. Another method of individual treatment is to get some carbolic acid (which must be of the clear or white quality), and placing some in an iron spoon or saucer, hold it over a lamp. Dense white fumes will arise, in which the chicken's head is to be immersed till nearly suffocated; or if a number have to be treated the whole may be confined in a box and fumigated at once; being, however, carefully watched through a hole in the box covered by a piece of glass. For, while this treatment is unfailing, it is a ticklish operation, since the worms have to be killed without *quite* killing the chickens, which is very easily done beside. There are other methods of a more general character. M. Mégnin proved repeatedly that to substitute an infusion of garlic for water, and add fine-chopped garlic or onions in the food, will check the complaint and kill the worms. He has also tried, with marked success, dissolving in the water (to kill all worms that may find their way there) 1 part in 100 of salicylate of soda, and dosing each pheasant with 7½ grains of yellow gentian and 7½ grains of asafœtida—large fowls will need more. Only vermifuges which, like these, have a *strong odour* can kill parasites which inhabit the air-passages rather than the digestive canal; but there is good evidence of the success of this treatment in pheasant preserves which had been all but exterminated by gapes. An English "patent" taken out by Mr. J. H. Clark, a gamekeeper, is very similar. He takes and intimately compounds the following :—

Powdered quicklime	1 lb.
Powdered sulphur	½ "
Tincture of asafœtida ...	1 oz.
Arsenious acid (white arsenic)	1 drachm.
Oil of thyme, or oil of cummin	1 oz.

This is kept in a close-stoppered bottle, to prevent slaking of the lime or evaporation of the volatile constituents. When required two or three tablespoonfuls are placed in a depression in the centre of a coop in which the chickens are confined, and then a sharp blast from the nose of a bellows blows it all up into the air, filling the coop and entering the nostrils of the birds. It is said that one application is generally effectual, but if not that two, or at most three, at intervals of a day, are always so. We should be disposed to omit the arsenic. The advertised preparations known as "Kalyde" and "Camlin" are used in a similar way, and are well reported upon; even powdered air-slaked lime is fairly effectual. A very important point is, when worms are extracted, to do this on a clean sheet of paper and burn every one; and to burn, not merely bury, the body of every bird that dies of gapes.

Gout.—This may be distinguished from mere leg-weakness in young birds by evident pain as well as weakness, and generally by some heat and swelling of the principal joints, and sometimes of the feet. From rheumatism it is known by want of connection with cold and wet. A bird so affected should not be bred from. The treatment will be stimulating liniment to the joints: internally give a grain of calomel at night, and 20 grains of Epsom salts next morning, and after that ½ grain colchicum extract or 10 drops colchicum wine every day for about ten days.

Joint Disease.—Dr. Klein found cases both amongst game birds and chickens, in which a disease, commencing with lameness, proceeded until the bones were found softened, and sometimes broken, while the hock-joint became an open wound. A writer noted for his hostility to rearing poultry in large numbers has confounded this disease with "cramp" in chickens, stating that attempts to cure cramp are "worse than useless," a statement that speaks for itself. This disease, however, really is a hopeless one, the bones and joints being practically eaten away and necrosed by bacteria. If ever the bones of young chickens are found really softened, much more with any open wound, the birds should be destroyed and burnt. It is fortunate that, though destructive whenever it appears, this disease is rare.

Leg Weakness.—This is distinguished from other forms of lameness by attacking almost exclusively cockerels as they begin to approach full size, and especially those rather long in leg, while in all other respects the birds appear in perfect health. The causes are length of limb and too fast growth. The use of dry bone-meal is to a considerable extent a preventive. It can generally be cured if taken in time by leaving off all condiments and (for a time) animal food, and giving the following pill :—

Strychnine...	1 grain.
Citrate of iron	1 drachm.
Phosphate of lime ...	1 "
Quinine di-sulphate ...	15 grains.

Make 30 pills. One twice to three times a day.

Mr. Cobb advises colchicum, but this is only of use when the lameness has the character of *gout* (*q.v.*), and is a somewhat dangerous medicine to administer freely.

Liver Disease.—Of late years persistent and early in-breeding, combined with high feeding, and want of exercise, and the injudicious use of condiments, have caused a great increase in cases of disordered liver amongst poultry, which, however, differ much in symptoms, nature, and seriousness. Poultry highly fed in small yards, during summer, unless adequately shaded and plentifully supplied with fresh green food, are very liable to gradual *enlargement* or hypertrophy of the liver. The symptoms are not very definite, consisting chiefly of sluggishness in motion and appetite, and a tendency to somewhat yellow evacuations. The condition, when once fully set up, cannot be cured, but may be kept in check by shade, a more spare diet, green food, and an occasional dose of salts or carbonate of potash. *Congestion* is due to very similar causes, and the symptoms are similar, but more sudden and severe, and more evidently bilious, sometimes reaching to a distinct yellow shade about the face. There may be lameness, as in the next more severe stage. Maize causes many cases. The treatment, which in spite of the greater severity is more hopeful in this case, owing to its more sudden onset, is a course of saline purgatives, such as 10 grains of potass-bicarbonate and 6 of Epsom salts twice a day for a few days, or alternated with 6 grains of rhubarb; or if the attack has seemed very sudden, a grain of calomel first will be very useful, to be followed by a little of the B.P. dilute nitric acid in the water for a day or two, afterwards giving the above salines. Actual *inflammation* of the liver is a disease of the same class, but of an acute kind, and is speedily followed by death unless the attack can be relieved. The causes may be as before, but in our experience exposure to wet and cold, in conjunction with other causes tending to congestion, produces inflammation much more frequently than heat does. There will be somewhat similar symptoms, but with evidently more suffering, and especially the bird will show tenderness or pain. The skin is almost always yellow, and the evacuations yellow or tinged with blood. The bird may seem too tender to move about much, and very often there is lameness, especially in the right leg; if such lameness accompanies other symptoms, the character of the disease is nearly certain. Only energetic treatment is of any avail. The bird is to be held frequently over boiling water, when the steam will relieve the pain and inflammation; and half a grain each of calomel and opium must be at once given, repeated after four hours; then 10 drops of chlorodyne may be given every four hours for two days. All water to be acidulated with nitric acid as before, and the bird kept quiet, and only allowed a small quantity of bread and milk. If the urgent symptoms disappear, careful diet and small doses of salines, with iron tonic, will complete the cure. None of these functional diseases, though they may weaken the progeny, necessarily impart any constitutional taint. But the case is very different with scrofulous disease of the liver, the most common development in poultry of the tuberculous taint. To stamp it out is the only remedy for this kind of liver disease, as much as in the case of pulmonary consumption, for both of which see paragraph on *Tuberculosis.*

Paralysis. — Loss of power to move may occur suddenly or come on gradually, and be either almost general, or confined to one set of limbs or the legs. The cause may be rupture of a blood-vessel on or in the brain, allying it closely to apoplexy (*q.v.*), and in such cases known usually by the sudden onset; similar treatment will sometimes be successful. True disease or injury of the nerves is hopeless, except in two cases. (1) It may result from sudden injury, as by a blow on the back from something falling, or from rushing under a low perch, or through the entrance-hole of the house; in such a case rest and quiet for a few days, painting iodine tincture every day on the spot believed to have been struck or bruised will often be followed by recovery, being injury and not disease. (2) The other case is that of a hen or pullet subjected to excessive sexual intercourse, under which the poor bird's nervous system entirely breaks down. Such a case is often known by the back being nearly stripped of feathers, as well as the legs being paralysed. In this case seclusion and rest for a while, with a little iron tonic and a teaspoonful of coca extract in half a pint of water, generally cures; but care must be taken to give the male bird a greater number of mates, or to restrict his company to an hour or two daily.

Peritonitis.—Inflammation of the lining membrane of the abdomen. Now and then caused by injuries; more usually due to the escape of a ruptured ovum, or egg, into the abdominal cavity, and in a less acute degree by excessive straining or over-stimulation of the reproductive organs, in which way many cases are directly due to the stimulating condiments so largely advertised. As to symptoms, peritonitis may usually be suspected whenever a hen in full laying, with bright red comb, and with no previous illness, shows evident pain and distress, but does not seem egg-bound. Severe cases are practically hopeless: those of the less severe type may often be treated successfully by perfect quiet and the administration of five drops of tincture of hyoscyamus three times a day for a few days, with a little brandy occasionally. Steaming over boiling water is also most useful, which can be done gently by keeping the bird in an open basket, and holding this over a hot can.

Pip.—This word was once popularly applied to almost any disease; later it became identified with a hard and horny appendage at the tip of a fowl's tongue. In common with other writers, we formerly did not consider this as any definite disease, but as the effect of a dry mouth when the nostrils were obstructed, to be treated chiefly with cooling medicine, and perhaps applying honey and borax to the tongue. There are in truth many such cases. Dr. Salmon believes that there are others due to some inflammatory affection, causing secretion which deposits and dries at the edges of the tongue, the dry coating and epidermis gradually separating from the skin beneath. This may perhaps be the cause; but whether so or not, our experience has, in this matter as in some others, justified the popular idea against would-be scientific sneers, and convinced us that, although they are not common, there are occasional cases of a real epidemic, which causes death unless relieved, of which this is the distinguishing symptom, and with no "dry" mouth at all. Three outbreaks in different yards have come under our notice, and in two of them the scale at the tip of the tongue was nearly as thick, and quite as hard, as the nib of a quill pen, while the edges were almost as sharp as a knife. The fatal results we believe to be due to the soreness produced by these keen edges quite preventing the fowl from swallowing. It was unmistakably "about" in these yards. If a fowl apparently well in the main, is seen to pick up and then drop its corn, the mouth should be examined. If such a hard and sharp scale (very different from the ordinary rather hard and sharp tip of a fowl's tongue) be found, it should be removed by the thumb-nail, and the spot dressed a few times with honey and borax. Give soft food for a day or two, and a couple of morning doses of 20 grains Epsom salts, and the bird will speedily be well.

Pneumonia. — Inflammation of the lungs. Besides the cough, which might hardly be distinguished from that of bronchitis, there will be evident distress in breathing, like gasping or panting, and generally considerable matter coughed up from the mouth rather than the nostrils: the bird spends much of the time lying down. A good ear can detect "crepitation" if brought in contact with the back. The patient must be put in a warm place, and fed on a little bread and milk only. Rub in a little turpentine between the shoulders among the roots of the feathers, or paint on some strong iodine liniment as a counter-irritant; and, if observed early, give a tabloid or drop of B.P. tincture of aconite in a spoonful of water every half-hour. Later, or as another good alternative treatment, give two drops of antimonial wine or ipecacuanha wine, in water, every hour. If improvement sets in, give only half as often. If the bird is very weak, give brandy and egg. Very young chickens reared artificially often succumb to pneumonia, owing to coming from a far too hot and foul brooder into cold air. The heat should at once be reduced if this occurs; but for those affected special care, counter-irritation, and a little aconite or medicated wine in their water, is all the treatment such tiny creatures are capable of undergoing.

Poisons.—Acute inflammation of either crop, stomach, or intestines, or of all, is sometimes caused in this way, and is rarely discovered till too late for treatment. The most usual are the following. 1. Unslaked *lime* may be eaten, when used to disinfect runs. 2. *Phosphorus* may be eaten from rat poison, or a dropped box of lucifers. 3. Arsenic may also be picked up from poison laid about. The main symptom is obvious, acute suffering, of rather sudden onset: when this is observed, it should at once be considered whether any of the foregoing have been accessible, and treatment adopted accordingly, though usually too late. Phosphorus can be smelt strongly. For lime, give two large tablespoonfuls of oil, and then linseed tea or gum-water. For phosphorus, avoid oil, which makes things worse, but give thin cream of calcined magnesia, and then white of egg. For arsenic, give calcined magnesia freely, and a little later olive oil. Unless discovered and treated promptly, it is better to kill the poor birds.

Rheumatism.—This is to be distinguished from mere weakness by pain, and from gout by absence of swelling and heat; also by pretty evident connection with cold or wet, and by affecting both sexes and all ages. Affected birds should not be bred from, the tendency being hereditary. Treat by well rubbing in any stimulating liniment, such as Elliman, or Jacob's oil, or belladonna liniment, and put some salicin in the water. If this fails, try rubbing in Chaulmoogra oil, and give two drops of same oil three times a day. Another useful treatment is 30 grains salts, followed by 10 grains each of bicarbonate potass, iodide of potassium, and salicylate of soda in half a pint of drinking water, for a fortnight, painting the joints and toes with tincture of iodine. As a general rule, rheumatism is an indication for less meat and more green food, for the last anyhow.

Roup, Catarrhal.—This differs from a mere cold in being markedly contagious, and of course introduced by contagion, though fowls crowded into ill-ventilated houses contract it when others do not, and in airy runs and houses the stronger birds often escape when others do not. It begins as catarrh or cold, and will have been treated as such (*q.v.*) unless circumstances lead to a belief from the first that the more serious complaint has been introduced. The catarrh resists simple treatment, soon becomes more sticky, and acquires a bad smell, also increasing from the eyes, which often become swollen or closed, and with very obvious fever. Later the discharge may become almost cheesy, and accumulate in nostrils, eyes, and even throat, but does not form a membrane in the latter as in diphtheria. The disease assumes many phases and forms, and in consequence there are many widely different advertised remedies, of which it may be said that every one can chronicle both marked successes and dismal failures, according as it happens to "hit" the special type or stage for which it is adapted. The best general treatment is, as soon as thickening and smell of the discharge make the case clear, to make a mixture of peroxide of hydrogen and water in equal parts, with which spray (with an atomiser) or syringe or swab the throat, nostrils, and eyes, squeezing matter out first, several times a day. Internally give first half a teaspoonful of Epsom salts, and then the following pills:—

Balsam copaiba	1 oz.
Liquorice in powder	4 drachms.
Piperine	1 drachm.

With sufficient magnesia to make a mass. Make above into sixty pills, giving one morning and evening. The following may be kept as an alternative; there are cases in which each is best:—

Copper sulphate	30 grains.
Cayenne	1 drachm.
Hydrastin	30 grains.
Copaiba	4 drachms.

Add magnesia *q.s.*, and make sixty pills, to be given as before. Both these prescriptions have been well tested. We need scarcely insist upon the importance of isolation and of thorough disinfection of houses and runs with carbolic acid and unslaked lime; and convalescents should be cleansed with either the hydrogen peroxide or permanganate of potash solution up to the very last, transferred to a *clean* pen from the hospital for a few days before return, and only turned out on a genial day. While birds can be thus successfully treated, however, this is a disease which, when it has been fully developed, should in our opinion discard them from the breeding pen. When cases apparently at first of roup develop white or yellowish raised growths upon the throat or inside the mouth, the disease is shown to be *diphtheria* (*q.v.*).

Scaly Leg.—This is the well-known name for an unsightly coating of whitish scurf on the shanks of fowls, sometimes so thick as to form masses a quarter of an inch deep. In very severe cases left untreated, the joints sometimes become affected, the toes may drop off, and the bird die from the drain upon the system. It is most common in feather-legged Asiatics, in Cochins and Silkies most of all, but not confined to these. This disgusting disease is now known to be due to an itch-mite (*Sarcoptes mutans*), and is therefore very contagious, being often propagated from a hen to her brood, but more commonly from bird to bird. For this reason perches and houses where it occurs should be well treated with carbolic lime-wash, as well as dressing the fowls, which can be cured if taken in reasonable time. While cases are still mild it is sufficient to give a good scrubbing twice a week with soap and water, applying every night dilute sulphur ointment, or any of the special ointments sold by poultry medicine vendors, or a mixture of one part petroleum oil and three parts olive or colza oil. In severe cases, where the scurf is very thick, it is quicker to remove the raised and loosened scales under which the insects burrow. This can be effected by applying with a brush a thick dressing of soft soap, leaving this on for a night, and then standing the bird in hot water and well scrubbing, rubbing, and pulling off the scales, which will generally come pretty easily, after which the shanks are dried and treated as before; but a bird should never be allowed to reach a state to need this. Another excellent after-application for such cases, and indeed for all cases, is compounded by mixing half a pint of petroleum oil, a pint of water, and half a pound of soft soap, and simmering together on a hot stove, taking care, of course, not to ignite the petroleum. When cold this is bottled, and applied with a stiff brush after shaking. Twice a day of this mixture for a week, and once a day for another week, is usually sufficient for a cure. An anointing with this before moult, or with the petroleum and oil, is very useful as a preventive where there is any reason to fear this disease.

Skin Diseases.—Poultry are subject to various forms of these, but not very commonly, owing partly to the absence of sweat-glands already referred to; and they are not easily distinguishable or very amenable to treatment, for the simple reason of the birds being covered by feathers. Those due to insects, with the exception of scaly leg, are for this reason almost hopeless to treat, as the whole surface cannot be dealt with. Such are fortunately rare, but any cases of such "mange" diseases are best stamped out. Those more of a pustular or eczematous character are more hopeful. It is almost impossible for any ordinary poultry-keeper—or, indeed, anyone else — to find the distinctions mentioned by some veterinarians, but most of them answer to a little cooling medicine, rigid cleanliness, ample green food of the dandelion or lettuce tribe, and application of benzoated zinc ointment.

Tuberculosis.—In-breeding and late breeding, and confinement in close houses, have made this destructive disease, due as is well known now to the *Bacillus tuberculosis*, terribly common amongst fowls. It is chiefly found in the lungs, where it becomes "consumption," or in the liver, where it is the well-known chronic form of liver disease. The first sign of the former is cough, but the case is distinguished from bronchitis, catarrh, roup, or pneumonia by the more gradual onset of the cough, the absence of any acute symptoms, and the gradual wasting. Liver disease is generally manifested by a gradual failure of appetite, emaciation or "going light," and generally a shrunken comb and dull look in the eyes; on post-mortem examination the liver is found studded with whitish or yellowish cheesy nodules or tubercles, which may amount to quite masses of its substance. Tuberculosis in the liver is especially grave in fowls, because the bacilli often reach the oviduct, and hence may become actually included in the white of the egg, and perhaps its yolk, in which case the chicks will be born tuberculous, a thing scarcely possible except in birds.

Tuberculous fowls should never be bred from, and are unfit for food. Some cases may be apparently patched up, as it were, by removal to airy surroundings, feeding on oatmeal, with cod-liver oil and a little *raw* meat, and 5 to 10 grains daily of urea. But if such birds are bred from, the penalty must be paid; and as there is no sacredness about their life, as in the human race, the only sound policy is resolute eradication.

Vent-gleet or Cloacitis. — This arises from inflammation of the lower portion of the passage. It probably begins by redness and swelling, but the first symptom usually observed is a discharge, first rather milky, but soon offensive, which excoriates the vent and forms crusts. It always begins with a hen, usually we believe from a broken egg or yolk causing septic inflammation, but is propagated in copulation, and hence may spread in a yard or be imported with an infected male bird. Any hen found with it should at once be isolated, and the male bird carefully examined, and if necessary also isolated and treated. Give 30 grains Epsom salts, and twice a day inject first a 4 per cent. solution of cocaine, and immediately afterwards a solution of nitrate of silver 4 grains to the ounce. The fifth day commence a small copaiba capsule daily, and inject acetate of lead, 1 drachm to the pint. Feed rather low meanwhile, and dust any sore places outside with iodoform or aristol. If not well after two or three weeks, we would kill the bird, as the disease is not quite free from danger; for if the operator should touch his eyes accidentally before he has cleansed his hands, the result might be a most violent inflammation.*

Vertigo.—This is due to pressure on the brain, causing the bird to stagger or run round and round. High feeding is generally in fault. Quiet in the dark, with low feeding and 10 grains daily of Epsom salts, are often effectual, while immediately the bird may have its head held for a long time in a gentle stream of cold water. A short exposure to cold would cause temporary congestion, and only do harm; but continuance removes this effect, and is more analogous to application of ice to the head in brain fever.

Wattles, Swollen. — This may occur from injury, or from a bad state of health, especially in large-wattled birds. When the skin is unbroken and the swelling seems to contain no fluid, if it is a bruise it should be bathed with hazeline tincture; if a swelling, painted with iodine. Where there is much fluid the wattle should be lanced at the lowest part of the bag, the fluid evacuated, and its sac gently syringed out with a warm solution of perchloride of iron, 10 grains to the ounce.

White Comb.—This name is only properly applied to a comparatively mild ailment shown by an apparent white powdering on the comb, like flour or plaster of Paris, which sometimes extends over the head and down the neck, and causing more or less loss of feathers. It appears generally due to dirt, or over-crowding in small space, or want of green food. Appropriate treatment in any of these respects, with iron tonic in the water, is necessary first of all, with say 20 grains of Epsom salts to each bird, followed by a pinch of sulphur in the food every day for a week. The best local applications are carbolised vaseline to the comb and other bare red appendages, and equal parts of water and Wright's Liquor Carbonis to the head and neck if also affected. A far more severe and highly contagious disease, marked by scabs and crusts, is sometimes confounded with this, but is totally different, being of fungoid origin, and treated under *Favus*.

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* Many of the symptoms so closely resemble those of gonorrhœa, that identity has been suspected by some; but we have never been able to detect in the discharges, by any of the usual microscopical methods, the true gonococcus. If any scientific fancier should think he has identified this organism, we would feel exceedingly obliged if he would forward to us, through the publishers, a microscopical slide for examination, as the question may have a wider bearing than upon the immediate disease before us.

Worms.—A variety of these parasites infest the intestines of fowls, and some of them occasionally reach the oviduct, and may thus be found even in the albumen of an egg. Such an occurrence should always be followed by treatment; but the other usual symptoms, such as wasting away, slow movement, etc., are so common in quite other diseases also, that we can seldom really diagnose worms unless they are found whole or in portions in the droppings, or else in the intestines of dead birds subjected to post-mortem examination. The usual causes are probably foul ground or water, contaminated meat or other animal food, or neglect to remove the manure. The best remedies, for a good sized fowl, are 2 grains santonin, or 10 grains powdered areca nut, or either three or four drops of the oil or ten or twelve drops of the extract of male fern in salad oil. Professor Woodroffe Hill advises as the best remedy and dose in his experience, 1 grain santonin combined with 7 grains of areca nut. Any of these should be given after three hours' fast, followed by a similar time, and then by a laxative dose of salts and warm mash only for a day or two. All evacuations containing worms should be carefully burnt.

Many other forms of disease, as already intimated, are occasionally found in fowls when examined post-mortem. Some of them are due to small or microscopical parasites, vegetable or animal; indeed, some of the true mites are occasionally found infesting the air-sacs, and even the larger bronchi. Inflammation may be found, from some cause, in almost any organ. The kidneys and the reproductive organs are found from time to time atrophied, or hypertrophied, or the subject of disease, due as a rule to stimulating condiments, undue forcing with meat, or sexual excess. But while these ailments may be easily distinguished upon the post-mortem examination, they can rarely be distinguished with any certainty during life, and it would be of no practical use to discuss them at length, while few of them would repay treatment even if known. We have dealt, we believe, with such as are of really practical interest to the practical poultry-keeper.

VERMIN AND THIEVES.

Insect Vermin.—The combating of these has been partially treated already at pages 53, 96, but it is desirable to add here fuller details. They consist mainly of fleas, lice, red mites, and ticks, besides the leg mite treated above under the head of scaly leg.

Fleas infest the houses, and especially the nests, as much as they do the poultry. The individual bird can be cleared at any time, for the time, by a good dressing with *Pyrethrum* insect powder, which also helps in a nest. In powdering a fowl it is held by the legs with the head downward, when the feathers fall apart or separate, and the powder is readily dredged in. Some like to give first a slight spray of water to damp the roots of the feathers, which retain the powder longer. Where it can be obtained readily, a nest made largely with leaves of common moor-fern or bracken seldom has fleas; and another good plan is to use as a nest-egg one of the hollow white perforated ones in which is a piece of sponge soaked with eucalyptus oil. But the house must be systematically treated with hot lime-wash and carbolic two or three times yearly, and frequently spraying the walls with some carbolic mixture, of which the following is cheap and effectual: Boil half a pound of soft soap in three quarts of water, and while still boiling hot agitate with it a quart of the crude carbolic acid. Keep this corked and labelled "Poison," and when a wash is wanted mix a pint with a bucket of water, and syringe with it freely. Another wash quite as good is made by shaving up a pound of yellow soap in three pints of boiling water, keeping hot till all dissolved; then remove from the fire to avoid danger, add three pints of common kerosene and a gill of crude carbolic acid, and agitate briskly for fifteen minutes, which will make a creamy emulsion. When well emulsified add twelve quarts of weak soap solution and mix well. This is to be sprayed freely over the interior; if twenty quarts suds are added instead of twelve, it makes a very good dip or wash for the birds. These mixtures are as good for mites in the house or lice on the birds as for fleas.

Lice on birds may be also treated, as mentioned on page 96, either with insect powder or oil containing a little paraffin. The birds may also be dipped in the above dip, or in one made by mixing about 2½ ounces of creolin to one gallon of water, or may be touched here and there under the wings, near the tail, and in other places with sweet oil in which is mixed one part in eight of either paraffin oil or oil of sassafras. A more wholesale plan much used in America, where this pest is serious owing to the numbers kept, is to employ volatile liquid "lice-killers," of which many are advertised. A fair example of them is naphthalene dissolved to saturation in kerosene. This is often applied now and then to the roosts; but when a lot of chickens are to be treated a dozen or so are put into a large box without a cover, the bottom and sides being painted with the "killer," and the whole covered over with a coarse canvas lightly sprayed with the solution. The canvas is necessary, that the birds may have air enough to breathe. They stay in the box to be penetrated by the fumes for half an hour to an hour, and the process is repeated three times at a week's interval, in order to destroy the produce of the eggs or nits. They sometimes have a slight looseness for a day after treatment, but it passes off in a few hours.

The *red mite* lives mainly in the crevices of house and roost, coming out at night to feed on the birds. It is naturally white, but becomes red when fed with blood. The eggs are seen in crevices, especially where ends of perches rest, as white dust. All should be removable, and the surfaces of such places washed daily with kerosene, or still better the lice-killer above, painting the perches themselves once a week; but fire must be specially guarded against. This and frequent carbolic lime washing and removal of manure will be effectual. The birds themselves may be partly protected by touching here and there with oil and paraffin as above, or by the "dips" above given.

Ticks have been sufficiently dealt with at page 96. Touching with carbolised sweet oil is also pretty effectual.

Cats.—The best methods of guarding against these creatures have been mentioned at page 95.

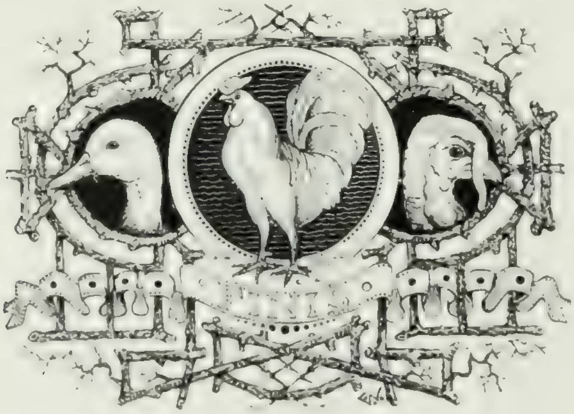
Foxes.—In some localities these animals are a very serious hindrance to poultry farming, or indeed any other kind of poultry keeping. Just in the very districts where this is most felt, the killing of a fox is regarded as a crime, socially at all events; but where serious pecuniary interests are at stake, those who maintain a sport should be willing to pay fair value for the losses which it occasions, and where this is not done reprisals in kind cannot be wondered at. Short of this, there are several very effectual precautions which may be taken; and it is curious that one or the other seems the best deterrent in one district, and quite a different one in some other. (1) A little asafœtida may be sprinkled round the entrance to each house, and about each gap in the hedge or fence where the animals enter the field. The scent lasts well, and the drug only needs resprinkling about once a month. This has repeatedly proved effectual. (2) Hang about six inches of iron chain in the centre of the hole by which the fowls enter, from the top. They will brush it aside: the fox dreads a trap, being the most suspicious of animals. Mr. T. C. Burnell vouches for the efficacy of this plan. (3) Few foxes will cross even two feet of wire netting, from the same dread of danger, and they are still more deterred if it be roughly brushed with tar now and then. (4) Bits of sacking dipped in gas-tar and hung at intervals on the hedge, will often protect the field thus enclosed. (5) Another similar plan is to plant short sticks or rods round the field, with hooks about a foot from the ground, supporting any rough cord well soaked in paraffin oil, and redipped occasionally. (6) If the hole for entrance is made at one corner of the house, and a sort of tunnel be made to it along the side, from which the birds turn in after walking about, few foxes will venture, and a sprinkle of asafœtida increases their dread. By day, of course, when the birds are about, the best precaution is a dog at large which has the proper animosity to "anything with hair on't."

Hedgehogs.—It is only of late that the ravages of hedgehogs have become generally known, their attacks having been put down to rats or other vermin. But recently a mass of evidence has accumulated to the effect that the hedgehog in the country frequently attacks fowls during the night, generally seizing on the hinder parts and eating away the entrails. In any case of this kind the best plan is to employ a professed hedgehog catcher.

Rats and Mice.—The former of these are often most destructive amongst the stock, and the latter to the food. Grain and meal should never be kept in wooden receptacles, but in iron bins, and never spilt about; carelessness in this respect is the principal attraction to the vermin. Asphalt floors are seldom mined by rats, especially if every hole is filled up with gas-tar and ashes; but when rats are known to be near, it is worth while to lay inch-mesh netting under the floor and a foot up the walls. When the animals do abound there are various resources. (1) Ferreting. This is very effective in experienced hands. (2) Poison. Phosphorus paste is generally used, but means lingering torture, and is dangerous to the poultry unless laid only in the holes. If these last can all be located, a plan often used in France is to stop all but one tight, and pour down that some bisulphide of carbon, then stopping that also; the vapour asphyxiates them, but is explosive with a naked light. We do not like poisoned food in any case, owing to the suffering involved; but if it is used, the best is probably quite dry plaster of Paris. Some oatmeal should be put about, in small quantity at first, till the rats have found it, and eat more and more, noticing what quantity they do eat, and only giving that. Then put same quantity made up of half plaster, first dried on a red-hot shovel over the fire. A dish of water should be placed on the ground not very far off. The plaster will cause inflammation and thirst, and the water they will hasten to drink kills them almost immediately, more quickly, at least, than any other poisonous proceeding. The fowls must be carefully kept away from it. (3) Traps. The trap in two compartments known to ironmongers as the "Wonder" trap, is the best, if used with patience. It should be fastened open for a week or two, with plenty of bait. It is a mistake and cause of failure to try to catch the first one or two, which would be decoys to tempt others in; they should be allowed to run through a week or two. Then, when a good catch is made, they should be allowed impunity again for a bit. A herring's head, or meat, or cheese will do for bait, especially if scented with oil of rhodium. Some toast stale bread and soak with ale, putting some round the entrance, with the idea that when intoxicated the rats lose their cunning; at all events, this also appears to answer very well, but the main thing is to let the rats have a safe run through for a while every now and then. Another good and most simple trap for mice as well as rats is a smooth, round, iron cask or bin, not less than two feet deep, with some corn and meal and a little cheese in the bottom, and something outside by which they can climb up. They will get in, but cannot get out, and may sometimes be found a dozen at a time.

Weasels and Stoats.—These are troublesome in some country districts. They are not disposed to enter traps much, but are not really suspicious, and can generally be trapped by hanging a dead chicken or other bait from a hedge, about eighteen inches from the ground, so that the animal has to jump to reach it, and placing a catch-trap underneath. The trap need not be concealed in any way.

Thieves.—The best security against these at night will be found in savage watch-dogs, properly "wired." Stout galvanised wire is fastened, where required, in fifty-yard lengths; to which a dog is tethered, so that the ring of the chain slides along the wire. One dog thus effectually commands a good range. Electric alarms which give warning when a door is opened at night, are easily arranged by any good electric bell fitter.



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